GOVERNMENT OF INDIA
ARCHÆOLOGICAL SURVEY OF INDIA
CENTRAL
ARCHÆOLOGICAL
LIBRARY

ACCESSION NO. 51363
CALL No. 919.105/J.I.A.E.A.

D.G.A. 79.

THE

JOURNAL

OF

THE INDIAN ARCHIPELAGO

51363

AND

EASTERN ASIA.

CENTRAL ARCHAEOLOGICAL LIBRARY
New Delhi

919.105

Edited by

J. R. LOGAN, F. G. S.

Member of the Asiatic Society, Corresponding Member of the Ethnological Society
of London, and of the Batavian Society of Arts and Sciences.

VOL. VI.

SINGAPORE:
1852.

KRAUS REPRINT

A Division of
KRAUS-THOMSON ORGANIZATION LIMITED
Nendeln/Liechtenstein
1970

CENTRAL ARCHAEOLOGICAL
LIBRARY, NEW DELHI.
Acc. No 57363
Date 7.8.72
Call No. 919.105

Printed in Germany

Received from Hindustan Book Agency d. 8.3.29

CONTENTS.

I.

Notes of an Ascent of the Mountain Kina-Balow .. Page 1

II.

Notices of Pinang . .. 18, 83, 143, 218, 521, 618

III.

Abstract of the Sijara Malayu or Malayan Annals with Notes, by T. Braddell, Esq.. .. 33

IV.

Palawan.. 55

V.

Ethnology of the Indo-Pacific Islands, by J. R. Logan, Esq., F. G. S. &c.. .. .. 57, 653

VI.

Essay on Semi-horizon Lights, by J. T. Thomson, Esq., F. R. G. S... 94

VII.

Notices of the Coast of Cambodia from Kampot to Chentabon, by Captain G. D Bonnyman.. .. 117

VIII.

On Coffee planting in Ceylon, by C. R. Rigg, Esq.. 123

IX.

Geography of Cambodia.. .. 173

X.

Notices of the Geology of the Straits of Singapore, by J. R. Logan, Esq... 179

XI.

Remarks on the South-west Coast of Cambodia, by Capt. G. D. Bonnyman.. .. 239

XII.

Land-locked Harbours.. .. 242

XIII.

Contributions to the Physical Geography of South-eastern Asia and Australia, by George Windsor Earl, Esq., F. R. A. S... 243

XIV.
Legend of the Burmese Budha, called Gaudama, by the Revd. P. BIGANDET.. .. .. 278, 499

XV.
A Narrative of a Voyage to Cochin-China, by CHARLES CHAPMAN, Esq... .. .. 290, 349

XVI.
Contribution to the knowledge of the North and East Coasts of New Guinea, by G. F. DE BRUIJN KOPS, Lieutenant, Dutch R. N... .. 303

XVII.
Journal of a Route Overland from Malacca to Pahang across the Malayan Peninsula, by Mr CHARLES GRAY...369

XVIII.
Account of the Horsburgh Light-House, by J. T. THOMSON, Esq , F. R. G. S... 376

XIX.
Concerning the Tan Tae Hoey in Singapore .. 545

XX.
Report on the Geological Phenomena of the Island of Labuan, by J. MOTLEY, Esq. . .. 555

XXI.
A few Remarks made during the Voyage of the Himmaleh in 1837, by the late G. TRADESCANT LAY, Esq. .. 574

XXII.
Concerning Colonel Farquhar's going to look for a place to establish a Settlement . .. 585

XXIII.
Notice of the Religion of the Cambojans . .. 605

XXIV.
A Trip to Mount Ophir 636

XXV.
The Commencement of Abdullah's Schooling . 643

XXVI.
Ceram Laut Isles .. 689

XXVII.
An Account of the illness and death of Her Majesty the Queen of Siam.. .. 692

XXVIII.
Table of the Average Monthly Temperature, indicated by the Thermometer at the Horsburgh Light House, from November 1851 to 31st December 1852 .. 698

XXIX.
Register of the Rain Fall at the Horsburgh Light-House for the same period . .. 699

INDEX.*

A

ABDULLAH's Schooling, the commencement of, xxv†.. .. 643
———— Account of the Tan Tae Hoey in Singapore, xix.... 545
———— Account of Colonel Farquhar's going to look for a Place to establish a Settlement, xxii.. 585

Agriculture :
On Coffee planting in Ceylon, viii.. .. 123

Australia, Contribution to the Physical Geography of South-eastern Asia and, xiii.. 243
Average Monthly Temperature, indicated by the Thermometer at the Horsburgh Light-House from Novr. 1851 to 31st Decr. 1852, xxviii.. .. 698

B

BIGANDET, The Revd. P.—Legend of the Burmese Budha called Gaudama, xiv.. .. ib.
BONNYMAN, G. D.—Notices of the Coast of Cambodia from Kampot to Chentabon, vii .. 117
———— Remarks on the South-west Coast of Cambodia, vi.. 239
BRADDELL, T.—Abstract of the Sijara Malayu or Malayan Annals with notes, iii.. 33
Burmese Budha, called Gaudama, Legend of the, xiv .. 278

C

Cambodia, from Kampot to Chentabon, Notices of the Coast of, vii...... 117
———— Geography of, ix...... 173
———— Remarks on the South-west Coast of, xi 239
Cambojans, Notices of the Religion of the, xxiii.... .. 605
Ceram Laut Isles, xxvi.... 689
Ceylon, On Coffee planting in, viii.... 123
CHAPMAN, C.—A Narrative of a Voyage to Cochin-China, xv. ib.
Cochin-China, A Narrative of a Voyage to, xv...... 290, 349

E

Ethnography and Ethnology :
Ethnology of the Indo-Pacific Islands, v..... 57, 653

EARL, G. W.—Contribution to the Physical Geography of South-eastern Asia and Australia, xiii.......... 243

---

* N.B.—Names of Authors in CAPITALS; Geographical names in *italics*; Arts and Sciences in Old English.

† The Roman figures refer to the number of the article in the table of Contents.

G

GRAY, C.—Journal of a Route Overland from Malacca to Pahang across the Malayan Peninsula, xvii .. 369
Gaudama, Legend of the Burmese Budha, called, xiv .. 278, 499
Geography :
  Of Cambodia, ix...... 173
  Notices of the Coast of Cambodia from Kampot to Chentabon, vii.... 117
  Remarks on the South-west Coast of Cambodia, xi 239
  Contributions to the Physical Geography of South-eastern Asia and Australia, xiii 243
  Contribution to the Knowledge of the North and East Coasts of New Guinea, xvi.... .. 303
  Ceram Laut Isles, xxiii...... .. 689
  Palawan, iv...... 55
Geology :
  Notices of the Geology of the Straits of Singapore, x 179
  Report on the Geological Phenomena of the Island of Labuan and Neighbourhood, xx.... .. 555

H

Harbours, Land-locked, xii...... 242
Himmaleh in 1837, A few Remarks made during the Voyage of the, xxi.... 574
History :
  Abstract of the Sijara Malayu or Malayan Annals with notes, iii...... 33
  Legend of the Burmese Budha, called Gaudama, xiv 278
Horsburgh Light-House, Account of the, xviii.... .. 376

K

Kampot to Chentabon, Notices of the Coast of Cambodia from, vii...... 117
Kina Balow, Notes of an Ascent of the Mountain, i...... 1
KOPS, G. F. De Bruijn.—Contribution to the Knowledge of the North and East Coasts of New Guinea, xvi 303

L

Labuan and Neighbourhood, Report on the Geological Phenomena of the Island of, xx...... .. 555
Land-locked Harbours, xii...... 242
LAY, G. T.—A few Remarks made during the Voyage of the Himmaleh in 1837, xxi.... .. 574
Legend of the Burmese Budha called Gaudama, xiv .. 278, 499
Light-House, Account of the Horsburgh, xviii 376
LOGAN, J. R.—Ethnology of the Pacific-Islands, v.... 57, 653
———— Notices of the Geology of the Straits of Singapore, x.... 179

M

Malayan Peninsula, Journal of a Route Overland from Malacca to Pahang across the, XVII.... .. 369
MOTLEY, J.—Report on the Geological Phenomena of the Island of Labuan and Neighbourhood, XX...... 555
Mount Ophir, A Trip to, XXIV...... 636

N

New Guinea, Contribution to the Knowledge of the North and East Coasts of, XVI.... 303
Notes of an Ascent of the Mountain Kina-Balow, I....... 1

P

Palawan, IV...... 55
Pinang, Notices of II.... .... 18, 83, 143, 218, 521, 618

R

Rain Fall at the Horsburgh Light-House, from Novr. 1851 to 31st Decr. 1852, XXIX.... 699
Religion of the Cambojans, Notices of the, XX.... .. 605
RIGG, C. R.—On Coffee planting in Ceylon, VIII.. .. 123

S

Semi-horizon Lights, Essay on VI...... 94
Siam, An Account of the illness and death of Her Majesty the Queen of, XXVII...... 692
Sijara Malayu, or Malayan Annals, with Notes, Abstract of the, III...... 33
Singapore, Concerning the Tan Tae Hoey in, XIX.... .. 545
——— Notices of the Geology of the Straits of, X..... 179

T

Table of the Average Monthly Temperature, indicated by the Thermometer at the Horsburgh Light-House, from Novr. 1851 to 31st Decr. 1852, XXVIII.... 689
Tan Tae Hoey in Singapore, Concerning the, XIX.... .. 545
THOMSON, J. T.—Essay on Semi-horizon Lights, VI...... 94
——— Account of the Horsburgh Light-House, XVIII...... 376

V

Voyage to Cochin-China, A Narrative of a, XV.. .. 290, 349
——— of the Himmaleh in 1837, A few Remarks made during the, XXI...... 574

List of Plates, Maps and Charts.

	Page
Village of Bacuit N.W. Coast of Palawan	55
Mushroom Rock ib. ib. ib.	56
Plates on Semi-horizon Lights	116
Coast of Kambodia (from Kampot to Chentabon)	117
Geological Map of Singapore	179
S.W. Coast of Kambodia	239
South-eastern Asia and Australia	243
Part of New Guinea	303
The Horsburgh Light-House	376
Pedra Branca	402
Section of the Horsburgh Light-House N.E. & S.W.	499
Pedra Branca at Low Water Spring Tides	ib.
Pedra Branca at High Water Spring Tides and Sections of Light-House	ib.
Machinery and Light Apparatus of the Horsburgh Light-House	ib.
Plans of Horsburgh Light-House	ib.
Chart of the Vicinity of the Horsburgh Light-House and Adjacent Malayan Coast	ib.

THE
JOURNAL
OF
THE INDIAN ARCHIPELAGO
AND
EASTERN ASIA.

NOTES OF AN ASCENT OF THE MOUNTAIN KINA-BALOW.

I sailed from Labuan in a native prahu belonging to Nakodah Gadore, a wealthy native merchant of Labuan, on the morning of the 21st February, 1851. We were enabled to make but little progress against the heavy sea and contrary wind of the north-east monsoon, so that it was P. M. of the 24th before we reached the mouth of the Kimanis, a distance of about forty miles.—The sea was breaking quite across the bar at the mouth of this small river, but we entered in a large canoe on the western or lee side of it, and at high water a boat drawing about six feet might possibly get in. The river is fresh and small, probably about 20 yards across; its banks are exceedingly pretty, and the village, which is about 4 miles from the entrance, embowered in groves of all kinds of tropical fruit trees and beautified by Erythrina and other gaudy flowering shrubs. Feeding in the pastures on the river banks were large herds of cattle and water buffaloes in excellent condition, and the whole of the village and its neighbourhood had an air of comfort and prosperity very unusual with towns so near the capital Bruni. The state of security which has produced this agreeable picture, is principally owing to the wise measures and firm character of the chief, the Orang Kaya Lamit, who though paying the tribute established by ancient custom, invariably, and for the most part successfully, resists all irregular imposts and the frequent attempts at extortion practised by the indigent and unscrupulous Rajahs of Bruni. Being anxious to get to the northward I staid but a few hours in this interesting place, which has been the scene where several struggles for supremacy amongst the rulers of Borneo have been terminated by the death of the unsuccessful aspirant. The grave of Pangeran Usup overlooks the village, and those of several other similarly ambitious and unfortunate chiefs of Bruni were pointed out to me. I of course had but few opportunities of conversation with the natives in so short a stay, yet as they had for some days expected a visit from me, a good many Dusuns from the neighbouring villages were collected together at the Orang Kaya's house, on my arrival. I saw also some Muroots, as the up country Dyaks are called by the Borneons, in the village. They are the same race of people and speak the same language, the Dusuns being more civilized, by their closer connection with the Borneons and dressing after the Malay mode, while the Muroots adhere to the primitive scanty dress and customs and maintain the independence of their ancestors. The term Idaan is used by the Bajows to designate both these divisions of the Dyak race of Borneo. Well authenticated traditions prove that formerly the people of this river were possessed of a maritime enterprize very unusual in their race, their trading voyages having extended to Java and other distant countries. So recently as 1848, three men of this river made an overland journey to Kina-Batangan, a large river on the eastern coast of the island, an enterprize which were an European to undertake he would have some difficulty in getting natives to follow him. They of course passed to the south of the mountain Kina-Balow and described the country they traversed as undulating and covered with forest, extremely populous and the people hospitable and kind, and pressing for a renewal of their visit. Beads and brass-wire, the only goods they had with them, were eagerly purchased at an enormous profit by the ignorant aborigines, who gave in exchange bird's nests, bees' wax and camphor. A large increase has lately taken place in this river in the cultivation of pepper, stimulated by a recent rise in its value and by the facilities afforded for its disposal by the establishment of Labuan. Formerly, however, their great staple was cotton, which they exported in large quantities to China and Java. To this cultivation they would readily return, were a market for it re-opened, as will probably be the case at Labuan, where, I was informed, ship loads of it would be delivered by the Dusuns at a price considerably under 1d per pound. Samples of the Kappas Sussun, which I saw, appeared of excellent quality and long staple. The river Kimanis is interesting to Englishmen as being the western limit of the grant of territory, made by the Sultan of Sooloo in the last century to the East India Company, through Dalrymple, the particulars of which are well known to all the inhabitants of the coast, most of whom would be delighted if our government would avail itself of its rights, they having already experienced in their greater security and consequent prosperity, the benefits of the English influence in their neighbourhood from the settlement of Labuan.

On the 26th, we entered soon after noon the mouth of the Tawar-an river, which, like that of Kimanis and most others on the coast, is obstructed by a bar, having the deepest water to leeward. Immediately inside the bar the water is fresh, even at this, the dryest season of the year. During the rainy months the floods from Kina Balow, and the mountains of the interior, cause a body of fresh water to be carried uncontaminated some miles out to sea. The river is about twice the size of that of Kimanis, and its banks low and covered with reeds for about six miles for its mouth. Inshore of the reeds we observed large numbers of cocoanut trees, marking the sites of the former villages of the Illanuns, who having originally settled here, were expelled by the natives about twelve years ago, their kidnapping propensities having made them undesirable neighbours. These gentlemen are those subsequently driven out, under the orders of Sir Thomas Cochrane, in 1846, from the rivers Tampasuk and Pandassan, where they had retired, and who now carry out an extensive system of piracy from the river Tuanku, on the east coast of Borneo, to the total destruction of the commerce of the neighbouring seas. We remained for the evening at the house of a Dusun, who had been converted to Islamism, being the only one of his race in the river who had embraced the faith of Mahomet. On walking into the interior, we found numbers of Dusun houses on the river bank, embowered in orchards of trees, and each surrounded by a garden of vegetables and sugar cane. Unlike the less civilized Dyaks, these people prefer to live in detached houses instead of under a common roof. All kinds of reports of my intentions in visiting the river, had been industriously circulated by the Borneons and Bajows, the least of which were that I was going to take forcible possession of the country, so that at first I could scarcely approach any of the people. When, however, they saw that I was apparently a more harmless animal than they had been taught to suppose, they changed their minds, and on the 27th, I had a numerously attended levee of all the people in the neighbourhood. The large deer of these islands is abundant in the neighbourhood of my host Umbui's house, situated about six miles from the mouth of the river.

On the afternoon of the 3rd of March, I found myself at the village of Bawang, on the right or eastern bank of the Tawar-an river, about 16 miles from its mouth, and on the morning of the 4th, we started inland towards Kina Balow, about which I had been unable to get any information that could be at all relied on. This is the more remarkable, as members of a tribe called Kohom, represented as living at its base, are in the habit of making occasional visits to Bawang for the purpose of disposing of tobacco, which they are said to grow of an excellent quality. A Bajow man had been hired as a guide to a village called Bun̄gol, which he represented as about a day's journey on this side of Kohom. The Dusuns of Bawang and all other places in sight of the great mountain, even as far as Kimanis, implicitly believe that after death they will be all translated to its top, to join the congregated thousands of those who have preceded them as inhabitants of these wilds. A belief similar to this I have invariably found prevalent amongst all the Dyak tribes of Borneo wherever I have travelled. The highest mountain known to them is invariably pointed out as the residence of the departed of their race, who it would appear, instead of nectar and ambrosia, delight in abundance of a species of mushroom or toadstool, specimens of which were pointed out to me as their favorite food. The old man in whose house I spent the night at Bawang said he had been to Balamban̄gan when the English were there. This must have been during the Company's last occupation of the island, as the old gentleman, though apparently very aged for a Dyak, could not be above sixty-two years of age. Our road lay for about a mile parallel with the river, when it turned suddenly up the steep end of a sandstone ridge to the eastward, but before ascending this we halted to collect and number the people. Our party proved to consist in all of forty-two persons. The Orang Kaya of Kimanis was director in chief of the caravan, under him were the Datu Pangeran of Menkabong, a celebrated old pirate, formerly a scourge of the neighbourhood of Singapore, but now retired from this enterprizing profession, and the Datu Maharaja Denda, the Dusun chief of Tamparulli, a pretty village below Bawang, and the man of greatest influence in the river. The motley following was composed of Bajows, Borneons and Dusuns, with here and there a stray China and Manila man. The ridge of decaying sandstone which we had ascended was covered with lalang grass having been recently used as paddy grounds by the Dusuns. The soil was a bright orange colored loam. At nine A. M. we had attained an elevation of 2,000 feet, after which we followed the narrow ridge, at about this height, in an E. to E. S. E. direction for about three miles, until we reached some detached houses belonging to a tribe called Si Nilu. We had previously left a path to the right, about a mile behind us, leading to the village of the Tagoh Dusuns, which we saw below us on a spur of the ridge, and where the Datu Maharaja made a visit, returning to us with a detachment of Dusun recruits for our expedition, who were enlisted for a certain quantity of cloth and beads. Judging from those we saw, the Nilu Dusuns seem miserably poor and their houses very filthy. They are said to be numerous but much scattered. We could get nothing from them in the way of provisions but a few green cocoanuts and kaladi (Arum) roots on which we breakfasted, after which again pushing on and ascending we reached the highest part of the ridge about noon, at a point called Tinkabāng, where the barometer stood at 27,704. During our morning's walk we had fine views over the level country between this range and the sea, the coast being distant about 18 miles and the ranges of hills nearly all running apparently parallel to it. In the N. E., we saw plainly the Mantanane Islands and to the northward the little Islet of Mengalong, together with a large extent of coast line, embracing the courses of the many rivers having their rise in the mountain and neighbouring hills. To the southward or inland, our view was obstructed, the Tawaran river was running along the narrow valley at the foot of the ridge we were traversing and beyond it were several parallel ranges of hills, the most distant reaching apparently an elevation of about 5 to 6,000 feet. Kina Balow itself, through the spy-glass in the morning, appeared white and glistening, probably the effect of the sun shining on its wet and barren rocks, as it had rained plentifully during the night. About 4 miles beyond the Nilu houses, the last half mile of which, having been more to the southward, had led us across spurs of the range and was vile walking, we came to the village named Kulawat, a collection of about forty houses, the inhabitants of which seem even poorer, more dirty, and more ignorant than those of Si Nilu. We could purchase neither rice nor fowls, though the harvest has but just concluded, and the few cocoanut trees about the village were devoted exclusively to the manufacture of toddy, of which intoxicating liquor the whole race of Dyaks are exceedingly fond and in the use of which at seasons of festivity they freely indulge.—The Dyaks met since leaving Bawang are certainly the most poor and unsophisticated I have ever seen, they appear however contented with their miserable lot; probably, however, they know of no other. They plant paddy sufficient only for about three months' consumption, after which they trust to their crop of kaladis and sweet potatoes, which are planted amongst the straw of the paddi, after the ears are reaped. These being exhausted they are reduced to the brink of starvation, living on leaves of trees and anything that can by any ingenuity be made to answer the purposes of food, until another harvest comes round. Above and around the village of Kulawat I observed abundance of a very fine kind of treefern, a species of Dicksonia, with the stem about 20 feet in height. From amongst the sandstone rocks about their roots, several springs of the purest water gushed out, keeping up the moist atmosphere in which these beautiful plants flourish and delight. Notwithstanding the poverty of the villagers, a few cattle in excellent condition came into the village from the jungle in the evening. We had passed during the day, considerable quantities of a coarse growing but very nutritious grass on which it is probably they subsist. The Dusuns, Idaan or Muroots of this part of the island differ from the Dyaks of the west of Borneo in this particular, as the latter will not eat the flesh of horned cattle, nor even anything cooked with their fat, a peculiarity they probably owe to the undoubted influence of the Hindus of Java in their vicinity in former times, an influence which we have no traces of in this part of the country.

On the morning of the 5th March, we left Kulawat at 6 A. M. and descended a spur of the range we had traversed yesterday, in a general direction E. by S. to E. S. E. After about 2½ miles' walking we came to a small tributary of the branch of the Tawaran river we had hitherto followed, named Tinuman. A mile and a half further brought us to the Bunḡol village on the high bank of the Tawaran. Soon after leaving the Kulawat village this morning we passed the path on our right leading to the Bangow houses, which we saw on the shoulder of a subspur of the range, surrounded by palm and fruit trees. Many other villages were to be seen from the same point in various directions, and the whole of the steep sides of the ridges visible on all sides appeared to have been cleared for paddi farms, very little "Utan Tuah," (old jungle), remaining, and that in the most inaccessible places. That part of the Bungol village in which was alloted our quarters consisted of about fifty houses, and though I was very anxious to push on after breakfast I finally allowed myself to be pursuaded to remain here by the Dusun Datu, who insisted that this was the only place on our road when we could supply ourselves with a commissariat. It was however fortunate that we stayed, as about 1 P. M. the rain came down in perfect floods, much to the alarm of our Idaan hosts, for the little brook, which on our arrival had been a limpid stream, flowing amongst boulders of rocks and scarcely a foot in depth, in two hours became an impetuous torrent of foaming muddy waters. The Dyaks who had beaten their large village drum to frighten the rain, assured me that the waters of the river sometimes came up to their houses, 50 feet above its ordinary level, and in this case must do them immense injury, as many of their farm houses and crops, I afterwards found, were on the lower banks of the stream.—This village is said to consist in the whole of about 120 houses, and they differ in no material particular from the Dyaks of the West Coast of Borneo. The men wear "chawats," a strip of bark cloth round their loins, and the women short petticoats manufactured from the fibres of a plant abundant about the village. A piece of cloth covers their bosoms, detained in its place by colored rattans round the waist, as I was informed a more affectation of modesty. Our trading made but little progress and the old Datu having been making merry with the natives, revealed to me the loadstone which had detained us at this spot, by bringing in the evening two very pretty and nicely dressed girls, who after having received a present of beads led away between them the tottering old chief to finish his evening in noisy revel in a neighbouring house, by which we were disturbed till nearly day-light next morning.

We left the village about 7 A. M. and after ½ a mile along the bank of the stream, which had quite subsided, we began to ascend a range, which we followed at an elevation of about 1,800 feet for three miles, when we again descended its abrupt face and struck a branch of the Tampasuk river named Tallas, where it joins the main stream, which was at this time about 30 yards wide and three feet deep. The rocks in the bed of the stream showed us instantly that we were in a country of primitive formation, water worn pebbles of syenite and other ancient rocks giving evidence of this. The range we had traversed during the morning was of the ordinary soft and decaying sandstone, with all the peculiarities of hills of this formation, such as very steep sides and narrow ridges, with abundant spurs and sub-spurs of the same character. Having traced the course of the Tampasuk river upwards for about a quarter of a mile from this point, we came in sight of the Kohom houses. A large crowd of the inhabitants were also to be seen on the hill above the main village, which was built on the only level piece of ground I had seen in the country. Having halted my party, which, from our having picked up numerous recruits by the way, had now become formidable, more particularly as each man carried a spear of about 10 feet in length, I sent forward an embassy with the old Dusun Datu at its head, to explain our pacific intentions, and to intimate that I intended to breakfast in their village. We soon were very cordially welcomed and lodged in the chief's house, when provisions of all kinds were produced in abundance, and hundreds of girls and children crowded to see us.—The village is very large, containing certainly not less than 250 to 300 houses. After having breakfasted, smoked and distributed beads amongst our fair visitors, I was determined to push on to Kiow, which was the next village, and the last station before we actually began the ascent of the mountain, of which we had a magnificent view just before entering this village. My proposition to march was loudly opposed by all my people, but by none so much as the Datu Maharaja Denda, who had contrived to get very tipsy while I was having my breakfast, and who, as I afterwards learned, had been carefully instructing the Kohom people to explain fully to me, that it was impossible to reach Kiow that night. Seeing that the sun was near the meridian, I thought a long walk might be overcome, and losing no time in arguing the point, I took up my stick and walked on up the river's course. Three or four of my men followed reluctantly, and we got on very well for about a mile, when the path ending in the shallow stream, we could nowhere find its continuation on the opposite bank, so that we were obliged to wait until overtaken by a guide, who had been despatched after us. The village we had just left is beautifully situated on the banks of the Tampasuk, a foaming torrent, with a bed of large granite, quartz and other pebbles. Situated on a level piece of land, it is backed by a hill, the sides of which are covered with the beautiful tree fern already mentioned, with its plumes of delicate green. The steep banks of the opposite side of the river, are beautifully clothed with large trees, from the branches of which hang creepers of various kinds in festoons to the surface of the stream. Orchids of numerous species abundantly adorn the trees along the river banks, amongst which I noticed several Saccolabiams and Vandas, and other kinds much valued at home.—Here, as elsewhere, these plants are not found, as is frequently supposed, in the thickest shade, but solitary half dead "pollard" looking trees most abound in them. Had it not been that the conditional nature of my time kept urging me forward to the mountain, I had certainly staid two or three days at Kohom, but as my orders were that should a steamer arrive on the coast, I was immediately to join her, for the purpose of looking after some Balanini pirates who had recently ravaged the coast, I was compelled to make the most of my time, fearing that the steamer's arrival might have prevented my reaching Kina Balow at all. We had several fine views of Kina Balow to the east of us to-day. It appears of an intense blue color, and through the spy glass its indented top is perfectly bare of vegetation, appearing to be inaccessible buttresses with very narrow ridges run up the mountain to within about ⅓rd from the top, beyond which appears nothing but steep precipices of rock, and the mountain, which from this river appears of a conical shape, seems to rise in naked precipices between the buttresses, almost from its very base. The buttresses themselves are covered with jungle, gradually decreasing to mere shrubberies towards the top. Our guide having joined us we proceeded over a hill, in a direction S. E. by E., to the shoulder of another range along a narrow table land, on the top of which we proceeded, gently ascending for about 2 miles. From this table land ridges of hills were in all directions around us, with torrents in all their vallies. The hills still retain the steep character of their sides, though all the blocks of stone we pass are syenitic granite. The dark base of Kina Balow was before us a little to our left; its top was hid in clouds. All the streams seemed to have their source in its direction, and, such as were visible, to join the Tampasuk. A hill on our left, which I should judge to be not less than 6,000 feet high, with a peaked top, and covered with jungle to its summit, had been cultivated with paddi during the past season to within 1,000 feet of the peak, a greater height than I had ever before seen this grain growing. The people said it gave a scanty crop.—The last two miles of our walk were up another steep hill, and we did not reach the Kiow houses till about 4½ P. M., very much knocked up, the difficulties of the steep ascent having been much increased by the rain, which had descended from the mountain and rendered the clayey loam exceedingly slippery. About half my following did not get in at all this night, having been so knocked up that they preferred remaining without fire or food in some deserted huts by the way side. After bathing and dining, we began to ask the Idaan about our chance of getting to the top of the mountain, but as usual they were unwilling at first to give us any information, not being satisfied with the accounts we gave of the object of our journey. They told us many marvellous stories of the dragons and spirits of the mountain, and excited the cupidity of my followers by the description of the enormous pearls which abounded on the summit, but which no man had ever dared to touch, as the sacrilege would be visited by darkness, and floods poured out upon the world below. Ultimately we learned that the Idaan would for a consideration take us to a point whence the summit of the mountain might be seen, but that it was perfectly inaccessible. The whole of the hills we had seen to-day were covered with the debris of rocks of primitive formation, particularly syenite, an undetermined dark grey rock of fine grain and great hardness, and a black rock like limestone traversed with veins of quartz. The Dyaks were busy planting their kaladi roots amongst these stones, though scarcely any earth was preceptible, and they appear to thrive well. Those we ate were floury and of an excellent flavour, unknown to the same root when grown in the marshy lands where we had been in the habit of seeing it cultivated.

7th March.—At 9 A. M. this morning the mercury of the Barometer stood at 27,174, the Thermometer being 76° in the shade. About noon I packed up and notwithstanding the great fatigue of the preceding day determined to push on towards the great mountain, which now appeared only 2 or 3 miles distant. I left the Orang Kaya of Kimanis and a lot of men at the village, in order that they might trade for provisions and despatch them after us by Idaan to be hired for the purpose. One of the tribe had agreed to guide us to the highest point known to these people for goods to the value of two pieces of grey shirtings (about 5 dollars,) who having armed himself with a bundle of charms, consisting of curious knots of wood, pieces of crystal, human and other teeth &c. in all weighing about 5 catties, finally led the way out of the village, and to my great horror down the opposite side of the hill we had yesterday ascended with so much toil, and which I had fondly hoped was part of the great mountain itself. About 1,000 feet below the houses we again came upon the Tampasuk, a foaming brook in which scarce even a little pool of quiet water was to be seen, so great was the commotion caused by the obstructions presented to the river's onward course by the large rocks of syenite. The brook or rather torrent here bore the name of Kalapis. We traced its stream upwards towards the mountain in an E. S. E. direction through farms of the Dyaks, collectively of greater extent than any I had ever seen, and proving the great numbers of the tribe. The Idaan, men, women and children, were busy weeding their kaladi grounds and planting succession crops. After three miles from where we first came upon the river, we found ourselves at the farm hut of our guide, situated fairly on the base of the great mountain, whose top was concealed in clouds. This being the last or one of the last houses on our route, and having gained my object of attaining the real mountain I consented to stay here for the night. We were furnished by the people of the farm houses round us with eggs, rice and vegetables; the kaladis of these mountain regions roasted in the ashes are excellent food—their tobacco was also of excellent flavour. On the banks of the stream which passed our door I saw several species of mosses, indications of our mountainous situation,—a fine Bryum not in fruit was the most common. A good many interesting butterflies were also flying about. The vegetation in general did not differ from that of the plain—the masses of rock seen in the torrents were still the hard unknown rock before mentioned, syenite and quartz.

The Kiow Dyaks have displayed more curiosity than any of the other tribes I have passed since leaving the banks of the Tawaran river, the girls and boys climbing to the tops of the houses, in order to see the strangers over the heads of the crowds that surrounded us. Much to my relief my Chinaman Amoo attracted a large share of their attention, his long tail being considered an amazing curiosity. Both in their houses and persons they are exceedingly dirty, the women and children, more especially, appearing never to make use of water for the purposes of ablution, though several clear springs have their waters carried past the doors of the houses in bambu aqueducts of considerable length supported on forked sticks. I found that coughs and colds were very prevalent among the children, but saw no appearance of Goitres, which are common in the mountain regions of Sarawak, though there no houses are found at a third of the elevation of this village. The climate to us felt damp and cold, and we were informed that days on which rain does not fall during the afternoon and night are exceedingly rare.—The tribe of Kiow is said to be of comparatively great numerical strength, numbering upwards of 2,000 fighting men. This I can easily believe from the extent of their farms and the numbers of women and children, who, consisting of many hundreds, constantly surrounded me. The only arms I saw amongst them were spears and the ordinary short chopping knives; their shields were round and frequently used as hats.

On the 8th March we left the hut at about 7 A.M. and ascended one of the butttress like projections of Kina-Balow, through an uninteresting jungle and by a steep ascent.—At 11 A. M. we had reached a place where two small streams met on their way down to the valley, here we breakfasted on cold rice and sardines. The Thermometer standing at 63° 5′ made the place feel cold and uncomfortable, the Barometer stood at 25.314. As we were crawling up a bare patch on the hill a little before reaching this spot, we had a fine view of a waterfall descending the opposite spur of the mountain. It appeared to us to have a fall of at least 6 or 700 feet of perpendicular descent, the body of water was not however very considerable. In the damp jungle which surrounded our breakfasting station were many interesting mosses and ferns; the trunks of the stunted trees were entirely clothed with long festoons of the former—and a large moss, apparently a species of Polytrichum, attained a height gigantic for its tribe. On the banks of the little brook I observed two species of Begonia and a fine Impatiens, the Balsam with large lilac flowers. Having finished my cigar we again commenced a descent, which we found very difficult from the slipperiness of the stones which formed our path. Our object was to attain a place where we might pass the night, as it would have been death to have slept on the damp mountain without fire or shelter. At 2 P. M. we reached an overhanging rock which by the remains of fires we could perceive had been occasionally visited by the Idaan when hunting pig and deer, which are said to abound on the mountain—the floor was now however covered with a carpet of a beautiful species of Adiantum which appeared not to differ from the English species. I picked up also close by, a flower of a very fine Epiphytal Rhododendron. It had fallen from some plant above and was of amazing size, the limb being salmon colored and the tube and centre yellow—a long search for the parent plant was not crowned with success. A torrent rushed with impetuous violence past our rocky hut, and amongst the stones on its brink I found a good many specimens of species of Cyclostoma, the shell of which, of a brown color, was nearly flat. A very charming Anœctochilus was growing and flowering in the neighbourhood, but the leaves were not so splendidly marked with gold as the Ceylon species. The plant was however of larger dimensions, it bore white flowers as do all the species of this genus I have met. This spot was about 700 feet lower and being in a ravine more sheltered than that at which we breakfasted, the jungle was consequently large and dense.

9th March.—At 7½ A. M. we left our rocky camp, and immediately began a steep ascent. Flowers of another Epiphytal Rhododendron, smaller considerably than the last and of a brick red color, were picked up and brought to me by one of the men. We toiled till past noon up a hill of amazing steepness with a very narrow ridge, the jungle it bore being exceedingly small but the individual trees very numerous. We then arrived where the ground was almost level for a short distance, and here we saw the first Dacrydium and a plant or two of Phyllocladus. The trees at this place, which we found much more damp than the steeps we had just traversed, were also covered with moss. A little way further we came upon a most extraordinary Nepenthes, of I believe an hitherto unknown form, the mouth being oval and large, the neck exceedingly contracted so as to appear funnel shaped, and at right angles to the body of the pitcher, which was large, swollen out laterally, flattened above and sustained in a horizontal position by the strong prolongation of the midrib of the plant as in other species. It is a very strong growing kind and absolutely covered with its interesting pitchers, each of which contains little less than a pint of water and all of them were full to the brim, so admirably were they sustained by the supporting petiole. The plants were generally upwards of forty feet long, but I could find no young ones nor any flowers, not even traces of either. About 2 P.M. we had reached a shoulder of the ridge on which we sat down to rest. All kinds of trees, with the exception of a few Dacrydiums of the same kind as the Pinang one, had disappeared, we were surrounded only by shrubs and fern. Had it been clear we should have had a fine view from this spot but every thing above and below us was wrapped in clouds. I found on recovering breath that I had seated myself beside a small plant of a Rhododendron of entirely new character. Its oval leaves were verticillate and upon it was a loose bunch of pendulous bell shaped flowers, with a spreading bright scarlet limb, the tube being of a clear yellow; it reminded me very much of a head of cowslip flowers. Just before me I observed another shrub about ten feet high, a Rhododendron of similar character, but with its stems and leaves rough with brown scales. This bore bunches of scarlet (not crimson) flowers of the most brilliant color. Entertwined with it was another with larger and rougher leaves and heads of pendulous flowers of the most lovely rosy purple. At the base of these was a species of Pernettya (?) with mucronated leaves and large white waxy bells of flowers. These, with a most wonderful new Dacrydium, which at first I thought must be some cone bearing plant or spruce Fir, completed a cluster occupying about 10 yards square, which amply repaid all the toil I had undergone, most of the plants mentioned being forms new to science though allied to known genera. Had the rising mist not warned me, I had sat too long admiring them. At last I was obliged to yield to the impatience of the people and move on, for they could not have survived a night exposed at such an elevation. About the base and lower regions of the mountain many forms of Orchids were observable. Cœlogyne was the most common. I saw none in flower. On the higher parts of the hill we had passed two or three species of palm, the one a small rattan, the other a small straight stemmed palm which the natives value for spear handles. A small leaved Rhododendron or allied genus, with solitary tubular heath-like scarlet flowers, is plentiful as an Epiphyte on damp dead trees on the same regions, and a plant unknown to me, with habit and flower resembling "Cantua," is found in similar situations and is very beautiful. In all, I had seen to-day three species of Dacrydium, two of which I believe are undescribed, besides many fine Ericaceous, Epacrideous and Myrtaceous plants, with many genera and species new, gorgeous, and unknown to me. Pushing on from the last resting place our course led us through a perfect thicket of the plants just enumerated, occasionally traversing bleaker spots, where amongst scaly masses of syenite, we were surrounded by a most lovely Diosma, which made the whole mountain on which it abounded absolutely white with its very lovely and most numerous flowers, every little branchlet being perfectly covered with them, its height raised, according as the situation was more or less exposed, from 4 to 10 feet. Amongst the rocks below it another unknown pitcher plant abounded and pretty herbaceous plants were occasionally seen, but not in great variety. These and the bracing air, reminded me that I had left the hot and feverish districts of the tropical plains and was now breathing an atmosphere similar to that of home. At length, after by far the most toilsome walk I had ever experienced, about 5 P.M., having descended a hundred feet into a ravine, I found myself upon the edge of a little torrent and opposite to an overhanging rock of syenite, similar to that I had left in the morning, but less large. This was the highest point the Dyaks had ever reached,—all beyond was perfectly unknown. From the spot where we left the ridge we had seen the mountain; it was a perfectly barren rock of apparently a blue color and seemed about 1,500 feet higher than where we were. Up to this time the vigorous exertion had kept me from feeling the inclemency of the cold, but now while standing still, in order that they might erect a place for me to sit down upon, I felt it very severely, though the thermometer was standing at 52°. My men all declared that though hard walking was bad enough, it would not have deterred them, but that this degree of cold would force them to give in. Being well provided with all kinds of warm clothing, I divided my superfluities amongst them and having lighted large fires with the wood of Phyllocladus a fine yellow Rhododendron, Dacrydiums and other trees to which the ravine afforded shelter, and cooked and eaten large quantities of rice, sleep brought them oblivion of their sufferings during this toilsome day. Our rocky residence was situated in a thicket of trees, which had they been standing upright would have been perhaps more than thirty feet high, but they were growing so that their trunks were almost horizontal, branches only shooting up in a perpendicular manner. Several kinds of Orchids were growing in the ground beneath them and on their trunks, an Eria like plant, with spikes of white flowers shooting out laterally from the top of the elongated psuedo bulb, was the most common; a very pretty Cœlogyne with white flowers was also plentiful.

March 10th.—As rest was necessary for my men, and as it was impossible to proceed until our route should be first explored, I determined to devote this day to the collection of such seeds as might be in perfection, and examining the plants in the surrounding ravine. One of the most conspicuous was a large Rhododendron, with a trunk 9 inches in diameter, and with fine majestic foliage, crowned with tresses of flowers of a yellow or orange or salmon color, for they varied. Another grew immediately behind my hut, on the edge of a basin into which a cascade rushed. This species had verticillate box shaped leaves, about 1¼ inch long, was of rather slender habit, but covered with most gorgeous flowers of a deep crimson color. The comparatively large flowers of this species and its neat foliage render it the most brilliant I know of the genus. A less pretending, but not less interesting relative of this last, was one with linear leaves and red tubular flowers about an inch long, in all respects so precisely resembling some of the African Ericas, that I had some difficulty in persuading myself that it was not one; it formed a bush about 4 to 6 feet high. Lichens were abundant, but mosses and ferns less common than at half this elevation. The thermometer at 7 A. M. stood at 46° in a sheltered situation. It felt so cold that I could not muster courage to look at it earlier in the morning. I gathered specimens and seeds of many plants perfectly unknown to me; the large Amacaria like Dacrydium was not in fruit, a smaller one was covered with unripe berries and the trees of the curious Phyllocladus had also abundance of immature fruit. One of the most interesting plants was an unknown Labiatæ growing amongst the loose rocks in exposed places; it was a woody herbaceous plant about a foot high with small and neat obcordate foliage and large white flowers with a purple lip.

Two species of birds were the only living things we observed on this day—the one a small fly catcher, the other a thrush. The former had a pretty note; the thrush was a fine bird of black and reddish brown colors. Both were so exceedingly tame that I could not make up my mind to betray their confidence, so that I brought away no specimen. The food of the thrush appeared to be the berries of the Dacrydium.

March 11th.—At 8 A. M. we left the cave and pushed on through a perfect thicket of the plants above named, but which are of smaller size than lower down and not so forward in their flowering, the Diosma having but few of its blossoms expanded. The ascent through this thicket was very steep and tedious. Having passed it in about half an hour, we had the naked summit of the mountain before us, resting as it were on a base about half a mile wide, which though not level was in part comparatively so and the after ascent less steep than any we had hitherto passed. Amongst the shrubs in the thicket were several trees, about 15 feet to 20 feet high, of the Dacrydiums and the Phylloclades. I also detected a small Rubus in fruit, about 18 inches high, lurking amongst the bushes. Though on three side of us there was nothing to intercept the view, we saw only the tops of two or three mountains in a south easterly direction, recognized by my guides as in the Kina Batangan country, far below us. Thick clouds enveloped the earth.

We seemed to be standing on a small spot surrounded only by air. After having left the margin of the thicket we crossed a little swamp which abounded in a Sphagnum apparently not different from Obtusum, but I have unfortunately lost the specimens. The remainder of our ascent was very toilsome, though apparently not so steep as much we had passed. It was over the " herbless granite" which was scaling off in large masses and inclined at a considerable angle, probably about 40°. Shoes here were of no avail—I was forced to throw them off and then the rough rain worn surface of the syenitic granite was more easily passed. Though the sun was shining clear I felt no oppression from its rays—a fine bracing wind was blowing, though I have omitted to note its direction. On the previous day it was N.E. Finally, after innumerable rests, we reached the base of one of the jagged peaks of the hill. The base of another, which appeared about two hundred feet higher and was situated about 500 yards to our left, seemed accessible, but the rising mists from the valleys forced me to make for the nearest, which we attained at about noon. Instead of something like a table land which I had expected to find, on the summit of this part of the mountain was a sharp ridge not 6 inches broad. On placing my breast against it and looking over the ridge, I gazed into a circular amphitheatre about 80 yards broad, the bottom of which, from its great depth and my position overhanging it, was undiscernable, though I imagine I could see down two thousand feet. All its sides were overhanging precipices, except that opposite to my position, where I could see the sea line of clouds though a rent or opening in the rocks looking northwards. I found the jagged summits of the hill to consist of thin fragments of syenitic granite, with sharp water worn edges and of most fantastic shapes, my position was between the bases of two of them—they were about 150 feet above my head. I could not remain long admiring the majestic scene around me, for the frightfully dangerous position we had passed in the ascent, made me quite alive to the rapid lifting of the clouds from the valleys which I knew would conceal everything from our view, and caused me, immediately after having finished a bottle of excellent madeira to Her Majesty's health and that of my far distant friends, and deposited the bottle turned upside down with a paper in it in a conspicuous place, to read off the barometer and hastily begin my descent. A thick but small shrubbery of beautiful plants, however, in a hollow of the rocks soon arrested my attention, and here another Rhododendron was the most gorgeous of the cluster, which however I think must be only a stunted variety of the crimson flowered one already mentioned. Its leaves were not half the size, nor did the plant attain the same height, but this was the case with all the plants which were found at this elevation. A little Orchid grew on the highest rocks and a silvery pinnate leaved herbaceous plant was found very high up. I remained long enough about this cluster of shrubs for the clouds to surround us, and we were soon in thick Scotch mist and could see nothing. There was no help for it but to squat down and wait till it passed on. In about two hours it was again fine, but my poor coolies had suffered much from the cold rain. I was clothed in flannel but still felt bitterly cold—the rocks over which lay our road were rendered very slippery and dangerous by the rain. One of my men, despising the caution with which I avoided all the little runs of water and selected the best drained places, attempted to make a short cut by following the course of one of these. His life had well nigh paid the penalty of his rashness,—his feet slipped from under him and away he went at railway speed down the inclined plain; fortunately for him he was wearing a long Sooloo kris in his girdle in a wooden sheath, this dragging along the rocks was caught in a crevice and saved its owner from destruction. He had slid about thirty yards, thirty more had shot him over a precipice. The roughness of the rock had made sad havoc of his flesh, but he fortunately escaped serious injury. We again spent this night, being the third, at our friendly rock, the elevation of which I found to be 8,386 feet. My observation of my position on the summit of the mountain gave 8,615 feet, but it is not trustworthy, as the mercury, which for 10 minutes remained stationary at the same height as at the lower station, was still rapidly falling. The detached Thermometer stood at 53° noon of a fine day in slight shade—exposed in its case to the rays of the sun it rose to 86°. As so frequently happens, I had no view from any of the prominent points of the mountain I gained; every thing was invariably enveloped in cloud. I wished very much to have returned once more to the highest point I attained, which I imagine was about 11 or 12 hundred feet* higher than the cave, or about 9,500 feet, but my time having expired and feeling certain that the dreaded steamer must be waiting for me, I packed up my specimens on the 12th and descended to the house of my guide in the paddy farms the same day, to the almost total deprivation of the use of my knee joints for a month afterwards. To make it cool and pleasant it rained during the whole descent, and many of my followers threw away their packages of specimens and plants, to my great sorrow and loss. I will, however, if opportunity permit, make another ascent from a different point at some future day, but from what I saw, I feel certain the highest summit, wherever it is, which has been made by triangulation between 13 and 14,000 feet, is inaccessible to any but winged animals. I conceived that I had reached the true summit of the mountain, and certainly no point within sight was more than 5 or 600 feet above me. I imagine that the measurement by triangulation considerably exceeds the true height.

---

* This I think is an under estimate, as the first part of the ascent was very steep, and the whole of it sufficiently so to be exceedingly fatiguing and 4½ hours were occupied in overcoming it.

Note.—It will be observed that I have made no mention of the Lake Kina Balow, supposed to exist on the S. W. base of the mountain. I made diligent enquires of the Dyaks but could learn nothing satisfactory about it. Very few had ever heard of such a lake; here and there, one of the tribes near the mouth of the Tawaran river had heard of it as a tradition and that one of the branches of the Tawaran came from it. If this was the case, it must be very near Bawang, and I think that did it exist and were it large, something more certain would be known about it in that neighbourhood, for the western branch of the Tawaran is a mere brook and cannot have a long course, perhaps not more than 20 miles. The state of the atmosphere entirely prevented my ascertaining anything like a knowledge of the country beneath me from the highest point I reached. I have in contemplation an expedition for next year, which will have the solution of the lake problem for one of its principal objects, if I am enabled to carry it out, as well as the determination of some other points of geographical interest.

L.

NOTICES OF PINANG.

In September 1805 the new Government framed for the administration of Pinang arrived in the island from England and held their first Council on the 20th September, when the several commissions having been read, the following despatch from the Hon'ble Court of Directors establishing the Government was recorded :—

To Phillip Dundas, Esq., Governor,
John Hope Oliphant, Esq. 2nd in Council,
Alexander Gray, Esq., 3rd do.
Colonel Norman Macalister, 4th do.
Of Prince of Wales Island.

Para 1. Having resolved that the future system of managing the Company's affairs of Prince of Wales Island, shall be by a Governor and Council and having the highest opinion of your integrity and ability, we have appointed you to the execution of that important trust and enclose you a Commission of Government accordingly under the Company's seal. We likewise enclose you a separate Commission which we have granted to the Governor appointing him Commander-in-chief of the fort and garrison.

2. Hitherto the government appointed for this island has been considered merely as of a temporary nature. It has long been our intention however to establish a regular system of administration for the island, but from various causes that system has not been formed till now, although from the spirit of British rule even when imperfectly administered, industry, enterprise and improvement have appeared to a considerable extent on the island, and its population, produce and commerce are already very respectable, yet the growth of the Colony has in many ways been impeded by the want of regular government and laws, and as the inhabitants have become more numerous, that want has been more felt and complained of.

3. The position of this island, its climate, its fertility, its harbour, its produce of larger timber, its contiguity to Pegue, which contains the most abundant teak forests in Asia, have long pointed it out as an acquisition of very great importance in a commercial and political view, being placed in a most favorable situation for an emporium of commerce in the eastern seas, and for becoming a commanding station for the rendezvous, refitting and supply of that portion of His Majesty's Navy required for the protection of the Company's possessions and affairs in the eastern parts of Asia.

4. From these causes it has been in our contemplation for some years to place the island under the same form of government

---

* Continued from p. 518, vol. v.

as the Company's other settlements in India enjoy, and to make it dependant immediately on the Company at home. By this measure we expect that the benefits of fixed government and laws will be established, and industry, commerce and general resort be thereby encouraged.

5. Our attention has lately been called to this subject not only by the general reasons already assigned, but by the necessity which the renewal of war has evinced of putting this important station in a state of security from the attacks of our enemies.

6. On these grounds alone we should have deemed it indispensably necessary to new model the government of the island, and take further measures for its security, but a plan which has lately been laid before us, of which a copy (and the papers accompanying it) is enclosed, at the desire of the first Lord of the Admiralty, for making the island a Naval Arsenal, for the building and repairing of His Majesty's ships, gives a new and high degree of importance to the subject, and renders the projected reform in the government absolutely indispensable. We are fully impressed with the object proposed by the first Lord of the Admiralty, entertain sanguine hopes of its practicability, at least to a certain extent, and have most willingly agreed to afford the utmost aid in our power in carrying into execution the measure proposed by His Majesty's government.

7. In the course of our deliberations on this subject, our attention has been drawn to a general consideration of the British interest, political and commercial, in the countries on the eastern side of Bengal. Besides Prince of Wales Island, the Company now possess in the Straits of Malacca, the town and fortress of that name, and on the south-west coast of Sumatra, Fort Malborough and its dependencies. The importance, both in a political and commercial view, of the island over which we have appointed you to preside, has been already noticed. Although this island may be made a Naval station, which under the authority of the British nation may become paramount in that quarter, yet it will not deprive an European enemy of the means of infesting with his ships the Bay of Bengal, because there is still an inviting port open to him in Acheen on the west coast of Sumatra, where the French in the two last wars were enabled to refit and supply their ships and speedily to resume their depredations in the bay. This port, properly strengthened, might command the southern shore of the Straits of Malacca, as far as Prince of Wales Island, and in the possession of the French, might prove the means of great annoyance to our trade, if it did not at any time give them the means of coping with the Naval Force, we should happen to have in that part of the world. To have the full command of the Straits of Malacca, therefore, it appears to be very desirable that the British nation should occupy the port of Acheen. The importance of this subject has been recognized at different times. In

1781 the Bengal Government was directed to acquire a settlement there which design was attempted in 1782 and again in 1784, without any other success than the admission of a commercial residency, which was withdrawn in 1785. Prince of Wales Island, indeed, had not then been acquired, and for a time it seems to have been thought that in obtaining this settlement we had done all that was requisite for the security of the national interests in those seas, but the gentlemen entrusted from time to time with the care of that island, appear to have seen the value of a connection with the king of Acheen; for in 1798 Colonel Macdonald, then superintendent of the island, submitted to the Governor General in Council, propositions for a treaty with the king of Acheen. The object of that treaty, however, on the part of the King having been thought only the exceptionable one of acquiring the right of monopolizing the trade of his own dominions, and the inducement held out to the Company being no other than a supply of pepper, (though possibly a political connection might thence have been established) the propositions were declined. But we have reason to believe, that the king of Acheen is now disposed to give the Company a more important footing in his territories, and we entertain a highly favourable opinion of the expediency of obtaining a footing at Acheen.

8. We observe that in 1798, upon a correspondence being opened with the Government of Acheen, the king expressed a desire to be supplied with two armed cruizers. The Government General, however, declined giving their consent to the adoption of any measures which had a tendency to implicate the British nation in the local policy of any native government, which might probably involve us in distant petty hostilities, to the great injury of the Commerce carried on between Bengal and the coast of Sumatra.

9. If these or if any other difficulties should occur in obtaining an eligible settlement at Acheen, or if upon further enquiry in India, any solid objection not known here should appear against the prosecution of this scheme, there is another place, namely Mergui, where the French are said to have of late resorted for provisions, and where with a view of depriving them of the resources of that coast, it might perhaps be expedient for the Company to establish an influence of their own. But the decision upon this subject must be referred to the Governor General in Council.

10. As a commercial establishment Bencoolen has become of no importance. The only produce of it, pepper, is a losing concern to the Company, who can be much better supplied with that article from the growing plantations of Prince of Wales Island, as well as from the Malabar coast. It has no value in a political view, for no other European nation can turn it to much account or bear the expence which must be incurred in maintaining it.

11. Having also taken into our consideration the great expence

at present incurred at Malacca without deriving any correspondent benefit, either from the revenues or commerce of the place, and the proposed establishment of Prince of Wales Island being calculated to supersede the necessity of maintaining a settlement possessed of no natural advantages either in point of product, trade or harbour, near to a station which is likely to unite all those advantages, we have signified to the Government of Madras, our determination to withdraw our garrison from Malacca and its dependencies, and whatever other establishment may have been formed there on our account. But previous to the abandonment of the place, we have directed that the fortifications, arsenals and public works of all descriptions should be completely destroyed and demolished, so as to render it of the least possible value to the enemy's government, in case the Batavians should hereafter turn their attention to the occupation of that station. The garrison and the public stores and effects are to be transported to Prince of Wales Island, and a particular account to be taken of them.

12. To such inhabitants, natives of India or China, as may be apprehensive of remaining at Malacca after the British garrison shall be withdrawn, we have directed that every aid and encouragement should be afforded them for the safe and convenient removal of their persons and effects, inviting and assisting them to establish themselves under the Company's protection at Prince of Wales Island, and the evacuation of the settlement at Malacca is to be so regulated as to give every facility to this object. You will therefore upon their arrival receive them with kindness and hospitality, and grant them upon such conditions as shall hereafter be specified, moderate portions of land to clear and cultivate for their own use and benefit.

13. We have directed the Government of Fort St. George to communicate with you on the subject of our orders respecting the evacuation of Malacca; it being our intention that when every thing shall have been properly arranged, under their directions, for the completion thereof, that the means of removing the Garrison, stores &c. from thence to your island, shall be provided by you, as the nearest and least expensive mode of effecting that object.

14. We are aware that in the first instance the new and more regular form of Government which we have resolved to adopt for Prince of Wales Island, must increase the expence of that settlement, not only because the number and quality of servants there must be enhanced, but because hitherto the persons employed for the Company on the island have been kept in general on salaries formed on the consideration of their having been allowed the privilege of trade. But as we entertain a reasonable expectation that the Company will be indemnified, for the charges they have already been at and are further to incur, in supporting an establishment at Prince of Wales Island, that indemnification must be supplied in a great degree from trade, which the Company may

carry on profitably in pepper and other exports of the island and in imports from Europe. We expect likewise that we shall be in part reimbursed by duties, customs and land rents and internal taxes, all which will of course be gradually augmented by the improved industry, population, and commerce which will follow from the superior protection and management resulting from a more regular system of administration.

15. Having communicated to you this general outline of the reasons and motives by which we were induced to form Prince of Wales Island into a regular Government, we have to advise you of the following establishment and appointments, with the salaries and allowances annexed thereto:—

Phillip Dundas, Esquire, Governor and Treasurer.[1]	ꝑ Annum	$32,000
For house rent, until a Government house shall be built under the orders of the Court of Directors, and for servants		4,000
John Hope Oliphant,[2] second in Council, Warehouse-keeper and Pay-master, to be allowed a commission upon the sales of Company's goods of 3 per cent, and his income, including that commission which is to be revised annually, is not to be less than		18,000
Alexander Gray[3], third in Council, Superintendent and Pay-master of marine, naval and military store-keeper, to be allowed a commission upon the sales of stores of 3 per cent, and his income, including that commission, is not to be less than		18,000

[1] Mr Dundas had previously served, it is believed, in the Bombay Marine and had been Master Attendant at Bombay. He was a nephew of Lord Melville and was selected for this Government on the ground of his knowledge and experience in Nautical affairs, fitting him for the work then contemplated, of rendering Pinang a Naval depôt and ship building port. He died in Pinang on 8th April, 1807.

DIED.

On the 8th of April, 1807,
(A few weeks after the decease of his wife,
MARGARET WEDDERBURN,
a lady of the sweetest temper and the softest manners)
PHILIP DUNDAS, Esq.
Younger of Arniston, N. B.
Governor of this Presidency,
aged 45 years.

[2] Mr Oliphant was a Madras Civilian. He died in Pinang on 23rd March, 1807.

DIED.

On the 23rd of March, 1807,
JOHN HOPE OLIPHANT, Esq.
Younger of ROSSIE, N. B.
Second Member of Council
at this Presidency,
aged 34 years.

[3] Mr Gray was, it is believed, also of the Madras establishment. He and his wife, were passengers and guests of Sir T. Troubridge in the Blenheim when she went down off the Mauritius.

Colonel Norman Macalister[4], fourth in Council, and Commandant, to be allowed in full for pay, Batta, and all other allowances whatever, civil or military......	18,000
Reverend Atwill Lake, Chaplain....	6,400
Henry Shepherd Pearson[5], Secretary....	8,000
Thomas Raffles[6] Assistant Secretary....	6,000
James Phillip Hobson[7], Accountant and Auditor......	8,000
William Robinson[8], Assistant do	6,000
Quintin Dick Thomson,[9] sub-warehouse-keeper and paymaster, to be allowed a commission of 2 per cent on the sales of the Company's goods, and his income, including that commission, is not to be less than......	6,000
W.E. Phillips,[10] Collector of Customs and Land revenue.	6,000
John Erskine,[11] Assistant to the Superintendent and store-keeper of marine, and marine pay-master, to be allowed a commission of 2 per Cent and his income is not to be less than......	6,000
Dr William Dick,[12] Surgeon, including pay and all allowances of his rank....	10,720
Henry Waring[12], 1st Assistant do....	3,000
James Heriott[12], 2nd do do....	3,000

[4] Colonel Macalister was a Captain in the Bengal Artillery, who had formerly commanded the Detachment of Artillery stationed on the island. Being at home at the time of forming the new Government establishment, and having probably been enabled to supply considerable information regarding the island, he was made 3rd Member of Council, with local brevet rank of Colonel and a Commission appointing him Commander-in-chief of all the Company's troops on the island. This brevet promotion was the cause of much subsequent jealousy and ill-feeling. He became in time Governor and on his way to England, via China, was lost in a typhoon.

[5] This gentleman belonged to the Bombay Civil Service, which he is said to have rejoined after failing in a contest with Colonel Macalister for the right to succeed as Governor.

[6] The celebrated Sir Thomas Stamford Raffles.

[7] Mr Hobson died in Pinang.

[8] Mr Robinson accompanied Sir T. Raffles to Java and held some lucrative post on that island which enabled him to retire altogether from the service.

[9] Mr Thomson died on the island in 1809.

Sacred to the Memory of
QUINTIN DICK THOMPSON, Esq.
of the Civil Service
of this Establishment,
who died
deeply and deservedly lamented,
after an illness of only two days,
on Thursday the 29th of June, 1809,
aged 26 years.

[10] Mr Phillips, as before mentioned in these notices, departed this life full of years, in 1850, bearing with him the respect and attachment of all who had known him on this island. He acted as Governor on many occasions prior to being permanently appointed to the office, the last occasion being in 1819 on the death of Col. Bannerman. Mr Phillips quitted Pinang in 1824.

[11] Mr Erskine became a Member of Council and continued such till 1823, when he retired from the service and went to England. He had been Mate of an Indiaman prior to being nominated on the Pinang Establishment.

[12] These gentlemen, it is believed, all belonged to the Bengal establishment.

Ten Writers at...... 1,440
whose names are as follows:
Arthur Tegart.
William Bennett.
John Curson Lawrence.
Robert Ibbetson.
John Thomas Le Mesurier Sherwood.
William Clubley.
John Lyon Phipps.
John McAlister.
Alexander Ballantyne Dick[13].
Thomas Cullum, Clerk and Schoolmaster........ 900

16. The persons filling the before-mentioned offices are to be restricted from trade, agency and from being planters for exportation.

* * *

23. In addition to the establishment above-mentioned, we have resolved upon the following:
Master Attendant, already on the island.. $3,600 ₱ annum.
Civil and Naval Engineer.

* * * *

Commercial.

45. Independently of the great political advantage of possessing a commanding station for the rendezvous, refitting and supply of His Majesty's Navy required for the protection of the Company's possessions in the eastern parts of India, with the ultimate view of constructing docks, &c., for building ships-of-war for the Royal Navy, one of its principal advantages in a commercial point of view, is the probability of its becoming in a more extensive degree, a general depôt for the commodities of India and China, particularly those of the British territories. It likewise is an emporium so situated as to afford an easy approach from every part of India from the extremity of China to the coast of Africa, and where merchants of all nations may conveniently meet and exchange their goods. From a situation so highly favorable for promoting the interests of commerce in general, the Company naturally look to derive advantages which will indemnify them for the expence they have already been at, and are further to incur in the support of this establishment.

46. It has been suggested that 250 chests of Opium annually sent from Bengal on the Company's account, might be sold at a fixed advance of per cent on the medium of the sales of Calcutta, the produce to be remitted to Canton in money or in goods. You will take this subject into your consideration, and with your opinion as to the quantity of opium that may then be annually disposed of at the island, refer the decision to the Governor-General

---

[13] Of these writers, the only person now alive is Mr Ibbetson, who retired from the service as Governor in 1833.

in Council. It appears that in 1789 three hundred chests were disposed of at the island, and that one hundred more were wanting to supply the market. In 1792 a supply of 200 chests was required in addition to the usual quantity of 250 chests.

47. Another source of commercial advantage to the Company may arise from the trade they may hereafter carry on in pepper and other exports of the island, and in imports from Europe; with respect to the former you will acquaint us what quantity of pepper may be procured at the island, and at what price. You will likewise report what other articles of export, would be likely to yield a profit in Great Britain. Prices current of the London market will be annually transmitted to you. With respect to the imports from Europe, we have ordered an investment of woollens to be provided to the extent of £25,000, and of such other goods as may be deemed fit for sale at the island. We rely upon your exertions for ensuring to those goods as quick and advantageous a sale as possible. You will likewise transmit to us an annual indent of such articles of British manufacture, as you think may meet with a ready and advantageous sale at Prince of Wales Island, particularly iron, copper, lead, broad cloth, cutlery, and the various manufactures required by the Malays, Siamese, Burmahs &c. &c.

48. It has been usual at the other presidencies, to dispose of European imports at public sales, but we think it inexpedient to limit you to that mode; probably, however, you may find it convenient to have one annual sale soon after the arrival of the ships from Europe. It must be left to your discretion to regulate the private sales at other times, as you shall find most advantageous to the Company, and for the encouragement of trade. An annual account of the imports and exports, distinguishing the different articles, list of arrival and departure of ships, their tonnage, &c., must be transmitted to us. We find that the average annual tonnage of ships for the last four years which have entered into and cleared out from the island is as follows:

Arrivals.. ..	48,731 tons.
Departures ...	47,189 ,,

49. It has been suggested that an ample and varied supply of marine stores as a monopoly in the hands of the Company would be productive of a lucrative fund of revenue. It is therefore our intention to provide a quantity of marine stores, to be sent to Prince of Wales Island, to be disposed of at an advance of 30 per cent on the invoice price to such ships resorting to the island, as may have occasion for them; and you will furnish us regularly with an indent for such marine stores as upon a moderate estimate you may be of opinion can be annually disposed of, and we rely upon your taking every precaution to prevent their wastage and embezzlement.

50. Having expressed our reasonable expectations that the commercial advantages of Prince of Wales Island, will reimburse the expences which have already been sustained in forming, and are likely to be sustained in maintaining that settlement, we shall proceed to the consideration of what other sources of emolument are likely to accrue to the Company, from the imposition of duties and taxes, in further re-imbursement of our expences, and this we shall do under the head of revenue.

Revenue.

51. At present the principal sources of revenue arise from the farms of opium, arrack, gaming, tobacco and betel leaf, and a duty on the exportation of goods and merchandizes. We concur in the opinion expressed by Colonel Kyd, that the two articles of revenue, farms of opium and gaming houses, appear to give encouragement to the two most dangerous vices in society. But we understand, it has been thought that the Chinese and Malays being naturally addicted to both, it would be impracticable effectually to eradicate them, and that under such circumstances, it only remained to confine the indulgence in those propensities to particular parts of the town under such regulations and restrictions as would furnish a resource to government. But it certainly would be far preferable in a political as well as a moral view, if these practices could be suppressed, and we desire therefore, that your attention may be directed to this end, towards the attainment of which it is not to be hastily concluded that a course of prudent government, gradually exciting habits of frugality, as well as industry, would not do much.

52. With respect to the import and export duties, we observe that in 1801-2 a duty of two per cent *ad valorem* was laid on the importation of tin, pepper and betel nut, and which in that year produced Spanish dollars 13,076. Upon the expiration of the year this duty was discontinued, and an export duty established in its place extending to other articles. We direct that you take into your consideration what duties on goods, either of export or import, can with propriety be imposed, and on what commodities such duties should be laid. It is a serious question with us, whether we should encourage foreign Europeans to carry the commodities of our Indian settlements to rival us in the foreign markets of Europe, and by what means that practice which seems to be a growing one might be best checked, and in order to assist our judgment herein we wish for a particular report from you of the state of the trade of foreign Europeans with Prince of Wales Island, and what regulations may appear to you proper with respect to that trade. Every information upon this important subject must be transmitted to us and to the Governor-General in Council, whose opinion thereon will be transmitted to us by you, though we shall expect to receive it direct from that government.

To whatever articles, either of import or export, it may be necessary to extend the customs, it is by no means our intention that they should be farmed. On the contrary, they must continue to be managed through a regular Custom House by the Company's officers. We are aware that different rates of duty may be established on different articles; to this point, also, you will of course direct your attention. You will likewise attend to the following suggestion:—that were merchandize landed and re-exported to be subject to a duty, it might operate to discourage Ships from touching at the Island, and from making it a depôt for the Eastern trade. We are at the same time of opinion that a moderate tax might be laid on goods, landed on the Island for home consumption. Duties might likewise be collected on Anchorage and Port-clearances. We have on this material subject confined ourselves to general directions, leaving to you the important trust of judging concerning the Rates of Duties which should be imposed. We doubt not you will fully answer this confidence, and we desire that you will state to us at large, for our final orders, the reasons on which your determination in every case shall be founded.

53. Your attention will next be directed to the raising a revenue from the taxable produce of the island, taking care not to oppress the inhabitants, or check the rising cultivation. We are of opinion, that hereafter a considerable revenue may be obtained from the cultivation of pepper and spices.

* * * *

It has also been suggested that a tax on cocoanut trees, would yield from 15 to 20,000 dollars per annum.

Grants of Land, State of Cultivation, &c.

55. We have reason to apprehend that upon our first taking possession of the island very little attention was shewn to the tenures upon which such grants ought to have been issued; a vague and undiscriminate order seems at first to have been given, entitling every person to such ground as he might be able to clear. At that period ground was said to be of such little value, that to ask was to have, or to appropriate was equivalent to legal right. Hence extensive tracts from 50 to 100 orlongs were possessed by men who would not cultivate more than from 15 to 20; we direct that you endeavour to ascertain the state of cultivation of the lands under such grants, for the purpose of resuming such as may remain uncultivated, agreeably to a clause which we understand to have been inserted in the grants, that they should revert the Company, if not brought into a state of cultivation within a fixed period.

56. There is reason to apprehend that some Europeans have in a wanton manner seized upon, or acquired by trifling purchases extensive tracts on the finest lands. The most effectual check should be given to practices of this nature, and you will endeavour

to ascertain the quantity of lands held by Europeans, and under what title, for the purpose of considering the propriety of resuming such as may have been transferred or acquired by Europeans, without the bills of sale having been registered in the Company's books of the island.

57 You will use every possible exertion to discover and prevent any usurious transactions upon the island. It appears that in some instances loans to persons in want of pecuniary assistance, instead of being advanced in cash, have been made in ship goods at a considerable rate beyond the cost price in the bazar, and that those advances actually cost the parties to when they were made 34 per cent per annum. The interest of money is not to exceed 12 per cent, which may be considered as the legal interest established for the East Indies.

58. We observe by the instructions to the late Lieutenant-Governor, that it was in contemplation to rescind the regulation of 1st August 1794, respecting grants of land for the period of 5 years, and it was proposed to render all existing and future grants perpetual. We very much doubt the property of this proposed regulation, at least all future grants of lands to Europeans must be made subject to our approbation; and instead of being granted in perpetuity they should be granted on long leases, renewable on a certain fine, and on payment of a quit rent increasing with the increase of cultivation, and a fine on their being transfered, it being our determination that no European resident in Europe shall hold lands by agents, and it must be a condition in the leases that it shall not be obligatory on the Company to permit the relations in Europe of Europeans who may die possessed of leases to go out in order to succeed to them. It must likewise be a condition of the grant that no large trees applicable to the purposes of ship building shall be cut down, except for those purposes; that the Company shall have the power of resuming such portions thereof as it may be deemed necessary to convert to public purposes, or such as may be found to contain mines of any description whatever. No grant of land to be made to Europeans exceeding in quantity 300 orlongs, unless upon very special reasons stated to us and approved by us. To encourage the clearing and cultivation of the island by making small grants of land to the industrious Chinese, would be a most desirable object.

59. We direct that you acquaint us with the state and extent of the pepper and spice plantations, distinguishing those held by the Company and by individuals. For our opinion and direction on the subject of the spice plantations, we refer you to the enclosed extract of our letter to the Governor General in Council, dated 29th February, 1804

60. It is stated by the late Lieut-Governor that in 1801-2 there were 723 persons who possessed landed property; and that there were at that time upon the island above 1,200 slaves. We

cannot authorize any encouragement being given to the introduction of slaves into the island, we could wish that the clearing of the lands, and the cultivation of the pepper and spices, should, as we understand they may, be carried on by free people. At the same time care must be taken that slaves belonging to ships occasionally resorting to the island gaining their freedom, be delivered up on sufficient proof of their being the property of the claiments.

Coinage.

61. We are not sufficiently acquainted with the coins current (to give any directions) upon this subject. The dollar we understand is the principal current coin, and we have reason to believe that the introduction of a copper coinage, of various demominations, would be of much public advantage. We wish to receive your opinion upon this subject, that we may take measures accordingly. A gradual division of coin, from the dollar to the pice, would be of singular convenience to the inhabitants, you will acquaint us whether you think it adviseable that we should provide copper coins for the use of your island and of what value and description.

Naval Arsenal.

62. We have already observed that the plan which has lately been laid before us, at the desire of the First Lord of the Admiralty, for making the island a Naval Arsenal for the building and repairing of his majesty's ships, gives a new and high degree of importance to the subject, and renders the projected reform in the government absolutely indispensable. We are fully impressed with the greatest national advantages of the object proposed by the first Lord of the Admiralty, and entertain sanguine hopes of its practicability, at least to a certain extent, and have most willingly agreed to afford the utmost aid in our power in carrying into execution the measure proposed by his Majesty's Government. In what proportion between Government and the Company, the expence to be incurred in the naval erections and fortifications at Prince of Wales Island, is to be borne, has not been yet decided, nor is the consideration of the general subject sufficiently mature to enable us to furnish you with any precise instructions thereon at this moment. It appears, however, to be generally acknowledged that the island Jerajah, one side of which forms the inner harbour, is the spot most proper for a dock-yard for Kings' ships. The forming of a dock-yard will necessarily require the erection of warehouses, workshops, and all the other appendages of such an establishment. For the construction of these a Civil Engineer and other artizans will be necessary, and will be sent out. It will naturally occur to you that preparatory measures may be early taken with a view to the commencement of this important undertaking; among these you will advert to the means of providing the various materials that may be wanted. Good stone and brick

we understand may be found upon the island, as also various sorts of serviceable timber; but for the supply of that which is most essential, namely the teak, recourse must be had to Pegu, and you will consider of all the measures that may be requisite for obtaining and transporting it. We desire to hear from you as early as possible upon these points, after you shall have procured information relative thereto.

Fortifications.

63. We find that something of the nature of a fort, has already been constructed on the island, and whatever may be necessary to put the island in a tolerable state of defence, we wish to be immediately executed; but it is our wish that a regular fortification for the permanent securing against an European force should be constructed. We therefore direct that you form and transmit to us a plan and estimate of such a work, and if there should not be a skilful engineer upon the island, you will make application to the Bengal government for the assistance of one from thence. But no fortifications of any great extent, involving an expence of magnitude, are to be commenced without the plan and estimate being submitted to our previous approbation.

Military.

64. We have already advised you of the appointment of Captain-Lieutenant Macalister to be commandant of the troops and fourth in Council upon the island; copy of his commission goes a number in the packet. We have deemed it proper to grant a commission to this officer, conferring upon him the rank of Colonel by Brevet at Prince of Wales Island and its dependencies only. But the rank granted to him by this commission is to cease upon his return to Bengal, nor is the Company to sustain any expense on that account beyond the salary of $ 18,000 per annum, already allotted to him.

65. The present force upon the island, as stated by the late Lieutenant-Governor, consists of a small Detachment of European Artillery.

1 Company of Golandauzes.
1 Company of Gun Lascars.
4 Companies of Sepoys.

66. The Garrison at Malacca, which agreeably to the intimation in a preceeding paragraph, is to be removed to your island, will afford an addition to this force of about 300 men, and should you deem the whole of this force insufficient for the protection of the island, you will make application to the Governor-General in Council of Bengal for such an augmentation thereof as shall be deemed sufficient for that purpose.

67. We enclose for your information and guidance copy of the mutiny act established for the East Indies.

Administration of Justice.

68. The administration of justice being a very important part of the arrangement required for the better government of Prince of Wales Island, we have presented an humble petition to His Majesty that he will be graciously pleased to grant a charter for the administration of justice in Prince of Wales Island, by erecting the Governor and Council with the assistance of a Recorder into a Supreme Court of Judicature.

69. When we consider that at the time we took possession of Prince of Wales Island it was uninhabited, our right to prescribe the system of laws which we may deem most eligible for the government thereof cannot be controverted, since none of its inhabitants who have repaired to the island can claim any prescriptive right, founded on ancient usage, to the establishment of any particular system of laws or form of judicial proceedings. The establishing, as far as may be possible, of one regular system of laws for the various descriptions of inhabitants, with a proper attention to their respective customs and manners, seems to be the most politic mode that can be adopted under the present circumstances of the island, you will therefore transmit to us from time to time such regulations and laws as you may think proper to issue for the internal government of the island.

* * *

74. You were advised in a preceeding paragraph of our having appointed the Revd. Atwill Lake to be chaplain of your island, and Mr Thomas Cullum, clerk and school master. As soon as may be convenient you will commence the erection of a church upon the spot already marked out by the late Lieut-Governor for that purpose. If the building now in use for the performance of divine service shall not be deemed eligible, a more proper one must in the mean time be selected. We trust by Mr Lake's endeavours and your example, the interests of religion and morality will be promoted in the island.

The following arrangements and appointments appear to have been made on this occasion:

Mr Dickens to continue as Judge and Magistrate till further orders.

Mr George Caunter's appointments as 1st assistant and Chaplain and Treasurer to cease.

Mr Mannington's appointment in the Land Office also to cease.

Mr Hall's office of Deputy Master Attendant to cease, and that of Accountant to be transfered to Mr Hobson.

Mr James Heriot to deliver charge of the Government Hospital to Mr Dick.

On the 24th September 1805, the following important resolution was come to:—

"Resolved - that for the present a house be hired for the
"reception of the young gentlemen appointed writers on this
"establishment and that a person be contracted with to conduct
"their mess, the annual expenses thereof to be deducted from
"their allowances

"Approved the following agreement

"Mr Porter agrees to furnish the young gentlemen of the Civil
"Service with their board at the rate of $\$1\frac{1}{4}$ per diem, including a bottle of wine among four."

The house so hired is supposed to have been that known by the name of Flower-pot Hall, and the former respected Governor of the settlement, Mr Ibbetson, who lately returned to England from a visit to his estates on the island, is the sale survivor of the *young gentlemen.*

ABSTRACT OF THE SIJARA MALAYU, OR MALAYAN ANNALS, WITH NOTES.[*]

By T. Braddell, Esq.

27th Annal.

Sultan Menawar Shah, king of Kamper, died at this time and was succeeded by his son Rajah Abdullah, who came to Malacca to be installed. Sultan Mahmud conferred on him the title of Sultan Abdullah, and he also gave him in marriage one of his daughters, the sister of Rajah Ahmed. After the marriage ceremonies were completed the king of Kamper returned home.

The Bandahara Putih died and was buried with due ceremony. The king called all those eligible to assemble at the palace, for the purpose of choosing a new Bandahara. At that time there were nine men in Malacca, any of whom might be made Bandahara, Paduka Tuan, Tun Zeinalabdin, Tun Talani, Sri Nara de Rajah, Sri Maharajah, Sriwah Rajah, Tun Abu Shehid, Tun Abdul, and Tun Bejaie Mahamantri. These were assembled. The king said, which of you noble gentlemen ought to be made Bandahara. Paduka Tuan answered, that as they were all qualified it only remained for the king to choose the one among them who was personally most acceptable to himself. The king's mother (Tun Nachua, sister of Taheir and Mutaheir), who was peeping from behind the door of the inner apartments, said—"Pa Mutaheir (her brother) ought to be Bandahara", for the king was much attached to his mother's brothers (consequently she felt sure of not being refused.) Pa Mutaheir was accordingly chosen Bandahara, and under his rule Malacca became even more populous and famous than before. The new Bandahara kept up great state, he rose to receive no one but the king, the heir apparent and the king of Pahang, but when the king of Pahang sat down the Bandahara seated himself close to him.

The Bandahara had a numerous family, first Tun Hasan, who succeeded his father as Tumunggong, one portion of his duty was to marshal the guests at the palace banquets, this he performed with great grace, moving about the wall like a Pendikur[1], who has practised dancing. He it was who enlarged the dimensions of the Malay baju, and lengthened the sleeves of that garment. Another son of the Bandahara was Tun Biajeid called Sri Utama, he married Tun Bhandra Panjang, daughter of Datu Bangko (crooked) Sri Bija de Rajah and by her had a son Tun Abdallah, and another son called Tun Leila Wangsa by a different mother, (daughter of a Bengali woman, concubine of the Bandahara Sri Maharajah) a daughter called Datu de Bukit married to Orang Kayah Abu Seyid and by him had Tun Hasan, who

---

Continued from p. 740. vol. v.

was married to the Tumanggong, son of Sri Maharajah, and by him had a son called Tun Madali,—he married Tun China and had a daughter Tun Ganggang, who was married to Tun Mahmud called Peduka Rajah and begat Tun Madah called Bandahara Peduka Rajah and he married Tun Aminah[2].

There was also Tun Gadut, grandson of Sri Amar Bangsa Tun Pang called Datu Bandahara of Acheen. The Datu had by Tun Aminah 3 sons and a daughter called Tun Ramak. Tun Anum, the eldest son, called Sri Maharajah became Bandahara, and Tun Jeinal, the second son, called Bandahara Peduka Rajah became also Bandahara. Another son of the Datu (by a concubine), Tun Ramba, called Sri Peduka Tuan became Panglima[3] Bandar of Acheen. Tun Anum had 3 children, Tun Riaih called Peduka Maharajah, a daughter Tun Amas[4] Iring, and another daughter Tun Putih married to Tun Ahmed, son of the Datu Sekudi[5], another son Tun Mahmad called Tun Marawangsa married a daughter of Tun Yusuf Beraga, and by him had a son Tun Yusuf Meisi called Bandahara Sri Maharajah the Datu Bandahara Tuah, his son Tun Ahmed called Peduka Rajah married Tun Gangang,—their children were Tun Sri Lanang called Peduka Rajah and Bandahara Peduka Maharajah and Sri Peduka Tuan and Sri Nara de Rajah, the youngest was a daughter Tun Putih. Tun Abdul called Sri Marawangsa had numerous children, one of his daughters married Orang Kaya Tun Rana and had Tun Abdallah and Tun Hidup Panjang, the father of Datu Jawa, the father of Datu Sangore and a daughter Tun Mandah adopted by Sri Nara de Rajah.

It happened that Patih Adam, the Pangeran of Surabaya, came to visit the Sultan of Malacca—he was one day in the house of Sri Nara de Rajah, where Tun Mandah was running about, being then a child; Pati Adam asked Sri Nara, if he would give him Tun Mandah in marriage when she grew up, Sri Nara said yes,—(this conversation rose out of play on the part of the child, who said she wished to be Pati Adam's wife.) Patih Adam returned to Java, and in due time came back for his wife, by this time grown up. Sri Nara had forgotten all about the matter and refused to acknowledge his promise, saying it was only play, but Patih Adam with his champions that night attacked Tun Mandah's house, and got possession of her, all his people were killed, but he had encircled Tun Mandah in his arms and threatened to stab her if they came near him. This threat caused a cessation of hostilities, and the result was that Patih Adam obtained his bride in marriage with the consent of all parties, and afterwards took her to Java where she bore a son Pati Housain, the great grandfather of the Pangeran of Surabaya who smoked.

The queen of Malacca, the mother of Rajah Ahmed, (Tun Wati, daughter of the king of Pahang) at this time died. The king consulted with his ministers as to what ought to be done under these circumstances, the kingdom of Malacca being without a queen (Rajah perampuan.) The ministers gave the usual answer, that they were prepared to do every thing in their power to execute the king's designs whatever they might be. "If I marry the daughter of a king, why any other king can do the same thing? but I wish to marry some one to whom no other king can aspire—the person I wish to marry is the princess of the Gunong Ledang[6], I shall send the Lacksamana and Sang Setia to ask her hand in marriage." Before the ambassadors set out Tun Mahmat was directed to send some of the Indraghiri people to repair the road, for Tun Mahmat was Panghulu over the Indraghiri people.

The ambassadors proceeded but could only ascend half way, the road being too difficult to go further. Tun Mahmat, however, went on by himself and being young and strong, he at last arrived at a garden of most miraculous beauty. In the centre of the garden was a bower in which sat an old lady attended by four young women. The old lady asked Tun Mahmat who he was and what he wanted? on which he told his business. The old lady, who said she was the principal person of the princess of the mount, and whose name was Dang (Dayang) Rajah Rani, on hearing Tun Mahmat's story, said she would go and inform the princess and bring her answer. She went and soon after an extremely old woman, whose back was doubled up in three, appeared and told Tun Mahmat the princess desired him to inform the king of Malacca that if he wished to marry her he must first make a bridge of gold and one of silver from Malacca to Gunong Ledang, and for courtship gifts she must have the heart of a mosquito, and the heart of an atom, each the breadth of 7 eating platters, a large jar of tears (ayer mata) a large jar of the juice of the young betel nut, a cup of the blood of the king and another of the blood of his son Rajah Ahmed. One account says this old woman was the princess herself in disguise. When the result of the embassy was related to Sultan Mahmud he said all the articles stipulated for would be easily arranged, but for the blood that was an insuperable objection, he could never make up his mind to draw his own blood and so the negociation failed[7].

NOTES TO 27TH ANNAL.

1. *Pandikur.*—A warrior.
2. *Aminah*—from Amin, constant, faithful.
3. *Panglima Bunder.*—Bunder a sea-port, and Panglima superintendent.
4. *Amas Iring* probably for Urung—the marcasite, although it does not appear that marcasites have even been found in the gold or tin mines of the peninsula.
5. *Sekudi,*—see Newbold II p. 106, for the tradition of the Bandahara of Sekudi or as he writes it Sekudai.
6. *Gunong Ledang.*—The situation of this mountain is fixed by the context in Sumatra and in or above Indraghiri. Tun Mahomed the Indraghiri Panghulu was sent on before to have the way cleared—perhaps one of the numerous sacred and mystic hills in Menangkabow, but not the Mount Ophir of European geographers, as in that case the Ambassadors would have ascended the Rakan river. Gunong means mountain or a range of mountains, in contradistinction to Bukit which is

applied to a hill. Ledang ليدڠ I do not know the derivation of, unless we may consider it a miss-spelling for لادڠ a plantation in high ground, as opposed to sawah or paddy lands.

7. The description given of this garden is apparently from Arabian romances, the device of building a bridge across the straits to Malacca is copied from a tradition of a bridge built by Alexander the Great. I have not heard any clear account of this undertaking of the all present and powerful Alexander, but it appears he built a bridge from Singapore to the opposite coast of Sumatra and probably the islands which are in no place at greater distances from each other than 4 miles, (according to the account of a writer in the Jour. Ind. Arch.) formed piers for the arches.

28th Annal.

It is related that Rajah Merlang of Indraghiri, who died at Malacca, left a son by his wife, the daughter of the deceased king of Malacca, named Narasinga, on whom all the Indraghiri people looked as their king. At this time the young nobles of Indraghiri were not treated as equals by those of Malacca, if they met them near a muddy place or a river, the Malacca nobles called those of Indraghiri and made them carry them across, for the Malacca people were more numerous than the other. The Indraghiri people at last went in a body to Rajah Narasinga and begged him to return with them to Indraghiri as they could not stay any longer at Malacca to be made slaves. Rajah Narasinga accordingly went to the king and requested permission to go to his kingdom, which had been given to him but which he had not yet seen; the king refused to allow him to depart. On this Rajah Narasinga fled from Malacca and arrived in safety at Indraghiri. His uncle Maharajah Tuban was in possession of the throne and on his death his son Maharajah Yusuf succeeded. Now on the arrival of Narasinga, Maharajah Yusuf was driven out of the kingdom by Tun Ketchil and Tun Ali and fled to Liñgga, where he was well received by Maharajah Tringanu, the king of Liñgga, who gave him his daughter in marriage by whom he had a numerous progeny and on the death of Maharajah Tringanu, Maharajah Yusuf succeeded to his throne.

Rajah Narasinga peaceably ascended the throne of Indraghiri and appointed Tun Ketchil to be his Bandahara.

Sultan Mahomed sent Hang Nadim to the Kling country to purchase 40 bales of chintz, each bale to contain 40 pieces, and each piece to have 40 different patterns. Hang Nadim sailed in Hang Yusuf's ship, for at that time all the Malacca people had ships. On arriving at the land of Kling, Hang Nadim presented himself to the Rajah and informed him of his master's wants. The Kling Rajah collected all the designers of his country to draw patterns according to Hang Nadim's directions. About 500 artists set to work, but they could not after repeated efforts satisfy the fastidious taste of the Malacca man, at last they gave up the task in despair, saying they had no more patterns to shew. On this Hang Nadim himself took a pencil and designed several patterns of flowers. The Kling artists were lost in astonishment to perceive the ability with which he designed and they eagerly sought his drawings to copy. The cloth in due time was prepared and the monsoon being favourable Hang Nadim returned homeward. Hang Yusuf had a quarrel with a Seyed with whom he traded. The Seyed said a balance remained unpaid, Hang Yusuf denied this and abused the Seyed, on which a curse was laid on his vessel, but Hang Nadim coming up at the time begged the Seyed not to mix him up in the business. The Seyed rubbed Hang Nadim on the back and said, Nadim you are safe. The ship sailed and on arriving in the Ceylon sea without rain, without a squall, and not suddenly, the ship with all her cargo sunk, but Hang Nadim was saved with his own people and some of his goods. The Ceylon Rajah sent for Hang Nadim and employed him in making a Tanglung telur.[1] When he was finished the Rajah was so pleased with the abilities of the artist that he wished to keep him, but Hang Nadim ran away and went on board a ship bound for Malacca, where he arrived safely. When the king heard Hang Nadim's story he was enraged at his gross stupidity in taking a passage in Hang Yusuf's ship, after he had himself heard the Seyed curse it.

Now the Lacksamana Hang Tuah died and was succeeded by Kwojee Houssein, his son-in-law, as Lacksamana of Malacca. Kwojee Houssein had by his wife the daughter of the late Lacksamana a son named Tun Abdul.

NOTES TO 28TH ANNAL.

1. *Tanglung telur* تڠلوڠ تلور the first word means a lanthorn and the other an egg—probably a peculiar shaped lanthorn used in the Budhist temples.

29th Annal.

Sultan Mahmud, the elder of Pahang died, leaving three sons, Sultan Abdul Jamil, Rajah مدفر (probably a clerical error for Mazaffer) and Rajah Ahmed. Sultan Abdul Jamil succeeded to the throne, he married a sister of Sultan Mahmud of Malacca, and by her had a son Rajah Mansur. At this time the Bandahara of Pahang, Sri Amar Bangsa de Rajah, had a most beautiful daughter named Tun Tiji Ratan Bangkal. She was very clever at opening pepper pods with her teeth. To such excellence had she attained in that art, that she could open a pod without splitting or tearing it[1]. She was to be married to the new Sultan at the commencement of the monsoon. Sultan Abdul Jamil in the mean time sent Sri Wangsa de Rajah to Malacca to inform the king his Suzerain of his father's death, and to request that he might be installed as his successor. Sultan Mahmud on hearing of the death of the king of Pahang, ordered the nobuts not to sound for 7 days[2] and sent Sri Dewa Rajah to instal the new Sultan according to custom. Sri Dewa Rajah after a short time returned to Malacca and gave the king an account of all he had seen there, among other things the beauty of Tun Tiji, the betrothed of the Pahang king, was highly extolled. Sultan Mahmud fell in love with her from the description of her charms and said, "I will give any thing, even to the half of my kingdom, to the person who will bring Tun Tiji to Malacca, and any fault, even a capital crime, will be forgiven." When Hang Nadim heard of this he determined to undertake the adventure, as a means of being restored to the favour of his sovereign, for he was still in disgrace about losing the 40 bales of cloth from the Kling country. Accordingly he set out for Pahang and by the assistance of an old woman, a perfume seller,[3] he succeeded in carrying off and bringing Tun Tiji safely to Malacca. On his arrival Sultan Mahmud was delighted to see the beauty of Tun Tiji and forgave Hang Nadim his offence. Tun Tiji was married to the king and according to one account produced him a daughter named Anama Devi. Afterwards when the king enquired of Tun Tiji how Hang Nadim had behaved to her? she replied "with great propriety—when I was getting into the prahu he covered his eyes with a cloth, so that he did not even see me." On hearing this the king's favour to Hang Nadim greatly increased and in addition to his former rewards he bestowed on him the hand of Chau Pok, one of the captured princesses of Kalantan, and gave him the title of Sang Naie. By the Kalantan princess Hang Nadim begat Tun Mat Ali, who begat Tun Hamza, who begat Tun Ali called Sri Patam, known as Datu Peduka Tuan of Campong Jelli[4]. When the king of Pahang returned home from pursuing Hang Nadim (he had followed Kang Nadim when Tun Tiji was carried off), he was mad with rage against the king of Malacca, he threatened to attack Malacca and being mounted on his favourite elephant, he said to his attendants, "thus I will destroy Malacca" and driving on his elephant he charged his own hall of audience and brought it tumbling to the ground[5]. When this was reported at Malacca, Sultan Mahmud promised a reward to any one who would go to Pahang and bring away the king's favourite elephant Kapinyang. The Lacksamana, Kwojee Hasan, undertook the adventure and being furnished with letters to the king of Pahang, as if on an embassy, he took his departure. On arriving at Pahang Kwojee Hasan was well received and the letter forwarded to the palace and read according to custom. After the reading was finished and the nobles sat down again, the Lacksamana was placed in an honorable seat next above the Pahang Sri Agar Rajah, and he now commenced to extinguish any bad feeling which might exist in the heart of the Pahang king against Malacca, by saying that Pahang and Malacca were as one country, and their kings as brothers and on that account they ought not to quarrel and much more to the same purpose, which, with the complimentary style of Sultan Mahmud's letter, somewhat modified his Pahang majesty, who denied that he had used any expressions of anger against Malacca, and said the story about the breaking down his hall of audience was a fiction devised by tale-bearers and mischief-makers.

Kwojee Hasan's vessel was anchored in the river, near the place where the elephants were brought to bathe, and by dint of bribery the Lacksamana at last succeeded in getting Kapinyang, the favourite of the King, on board his vessel and set sail for Malacca. This vessel was chased, but the Pahang men were kept at bay by the superior archery of the Lacksamana so that they dared not to close. On his arrival at Malacca the Lacksamana was graciously received and rewarded by his master, Kapinyang the favourite riding elephant of the king of Pahang was given in charge to Sri Rama, keeper of the elephants, son of the former keeper of the same name.

When the Pahang men returned unsuccessful from their chase of the Lacksamana, the King was grievously enraged, and his mind was so affected, that he resigned the crown in favour of his son Sultan Mansur Shah, who was assisted, being very young, by his uncles Rajah Muzaffer and Rajah Ahmed. Abdul Jalil went up the river till he came to a bend called Palang where he resided and lived as a hermit. He it is who is called Merhum Sheikh.[6]

NOTES TO 29TH ANNAL.

1. I must confess the interpretation of this is beyond my powers. I fancy it to be an allegory to express some mental or personal quality more consistant with the lady's high rank than the culinary operation described, but cannot follow the connexion.

2. A sign of royal mourning. On other occasions we hear of Malayan sovereigns ordering their nobuts not to sound when they are affected with grief or sorrow of any kind.

3. The Nini Kabaian of the romances, generally a perfume or flower seller, who from her occupation has admission to the inner apartments at all times.

4. *Jelli* or *Jelliye* is inland a little to the north of Malacca, one of the nine petty states in the interior which at the time of these annals were tributary to Malacca, but are now independent or nearly so. The other 8 are Segamet or Muar, Johole, Nanning, Rumbowe, Sungie Ujong, Jellabu, Salangore or Calang, and Ulu Pahang. Jellabu is the farthest north in 4° N. latitude. Salangore is on the coast north and Muar is to the south of Malacca, the others are all inland between 2 and 3° 30′ north.

5. This is a repetition—see XXV annal.

6. *Merhum* (from Rahim mercy) one who has found mercy—the deceased of happy memory—Sheikh, literally growing old, but applied as a title to a chief prelate, superior of derwishes, a doctor of divinity &c. Merhum is used as a title in speaking of some of the old kings, particularly those who distinguished themselves for mercy and charity.

30*th Annal.*

Rajah Zeinal, the king's brother, was remarkably handsome. When he went into the market place every one stopped to observe him, and the presents he received on these occasions were innumerable, so great a favourite was Rajah Zeinal. When he passed any house the women rushed to the windows to peep at him and great impropriety reigned at Malacca on this account. When the King heard of his brother's conduct he was greatly enraged at the disgrace brought on Malacca, asked which of his servants would kill him, but none dared to undertake such a work. At last he called Hang Berkat, the keeper of the palace gate and directed him to kill Rajah Zeinal, so that no one should know by whom the deed was done. Hang Berkat that night crept softly into the prince's sleeping apartment and stabbed him through the heart so that he died. It was generally believed that this was the work of robbers and Hang Berkat was greatly rewarded by the King for his expertness and the title of Sang Sura was bestowed on him. Sang Sura's wife committed adultery with Sang Guna and it was known to her husband who lay in wait for Sang Guna, so that he might slay him. When the king heard of this he was annoyed, as Sang Guna was no common man, he it was who first made krisses at Malacca of 2¼ spans in length. Sang Sura was a favourite of the King but in such a case what could be done, however he called Sang Sura and taking him to a quiet place earnestly desired that he would give up his designs against Sang Guna, and Sang Guna was directed not to come out of his own premises, so that he might not by chance meet Sang Sura and then be slain in spite of the Rajah's injunctions to the contrary.

31*st Annal.*

The Rajah of Ligore[1], Maharajah Dewa Sura, was directed by the king of Siam to invade Pahang and in consequence he marched with an army of two catti (200,000). Sultan Abdul Jamil[2], when he heard of the approach of Maharajah Dewa Sura, put his fort in order and prepared his forces to meet the attack. When Sultan Mahmud of Malacca was informed of this expedition he sent the Bandahara Sri Maharajah to assist the king of Pahang, for Pahang was tributary to Malacca and any attack made there was as if made on Malacca itself. A great force was prepared with prahus, large and small, too numerous to count, and the number of men sent was prodigious, for at that time the city of Malacca itself contained 9 laxas of people (90,000). The Bandahara set out and on his way met the Lacksamana Kwojee Hasan coming from Sungie Raei[3], for it was the custom that the Lacksamana should govern that district. The force of Sungie Raei was forty three-masted Lancherangs, the Lacksamana joined the Bandahara with his squadron and together they proceeded to Pahang. On arriving they assisted to repair the fort at Pahang and in three days every thing was ready to meet the expected attack from Ligore. The Lacksamana distinguished himself by his great energy in repairing the fort, and it was said of him that his hands worked, his feet worked, and his mouth worked.

The Ligore men arrived and a great battle was fought, but by the assistance of God the Pahang men were victorious. Maharajah Dewa Sura fled through the interior of Pahang to Kalantan and from thence returned to Ligore.

Sultan Mansur nobly rewarded the Malacca chiefs and they prepared to return home. Sultan Abdul Jamil and Sultan Mansur gave them a letter to carry to the king of Malacca and they departed. On their arrival at Malacca, Sultan Mahmud received the letter according to custom and was greatly pleased to hear that Pahang was not conquered by the Ligore Rajah.

There was a Mantri of Sultan Mahmud, named Tun Perpatih Hitam, (a descendent of Tun Jana Buka Dendang) who had a son named Tun Hosein. Tun Hosein boasted that if any one insulted his father he would amok. Now it happened by the will of God that Tun Perpatih Hitam had a difference with a trader and they went before the Bandahara to settle the affair. It was the custom when the Bandahara investigated any cause, that the Lacksamana and Tamoñgong should be with him. If an affront was offered to the Bandahara, the Lacksamana put the insolent one to death. If any one was to be apprehended and put in confinement that was the business of the Tamoñgong. Tun Perpatih Hitam was being examined by the Bandahara, when his son Tun Hosein came to attend him, armed with a kris panjang. Now when Tun Perpatih Hitam saw his son come thus armed, he wondered within himself whether he would do as he had said formerly and to give him an opportunity, he rudely scraping the mat with his feet, said, addressing the Bandahara Mantri—"what sort of a way is this to examine any one?" When the Lacksamana saw this behaviour he instantly drew the sword Likiewa, and saying " why, oh Orang Kayah, do you dare thus insolently to scrape the mat in the presence of the Bandahara?" at once cut him down so that he died.

When Tun Hosein say his father slain he drew his kris. But the Lacksamana said "intend you treason Tun Hosein?" At that moment the bye-standers fell on Tun Hosein and in spite of all the efforts of the Bandahara he was slain. The Lacksamana went and reported the whole affair to the king, who said that the Lacksamana had behaved in accordance with his wishes, and it was his order that he should co-operate and uphold the authority of the Bandahara, how could work go on otherwise, for any insolence offered to the Bandahara is as it were offered to himself. The Lacksamana was rewarded for his conduct with a dress of honor.

This Lacksamana had 3 children by his wife, the sister of Sri Bija de Rajah, the crooked Datu, 1st a daughter Tun Siri, married to Kwojee Hosein, 2nd a son, Tun Biajit, and 3rd another daughter Tun Sebriah, who was married to the king and bore him a daughter called Rajah Dewi. By another wife, a relative of the Bandahara Peduka Rajah, the Lacksamana had a son called Sang Guna and a daughter married to Hang Nadim, and by his wife the daughter of the Lacksamana Hang Tuah, he had also a son named Tun Abdul.

NOTES TO 31st ANNAL.

1. *Ligore* appears formerly, as well as at present, to be a province of Siam and not a tributary state as those further south were.

2. *Sultan Abdul Jamil* had abdicated in favour of his son Mansur (see end of XXIX annal) but he appears here to interest himself in the affairs of the nation, as if he had not given up his rights in favour of his son. A similar case occurs in Malac-

ca ;—in the XXXIII annal we find that Sultan Mahomed abdicated, but he in like manner, although he did not formally resume power, continued till his death to conduct all important affairs.

3. *Sungie Rayie* or *Raei* is near the Lingie river, north of Malacca, so he must have met the Lacksamana entering Malacca, or there is another place to the south or east of the same name.

32nd *Annal.*

It is related that there is a country named Kota Maleegei, whose Rajah, Suleiman Shah, was an Islamite. Now when the king of Siam heard that this country was very powerful, he determined to subdue it and sent one of his sons Chau Sri Bangsa with a large force for that purpose. The opposing armies met and a great battle ensued, during which the Siam prince was brought in contact with Soleiman and in the heat of the combat declared that if he gained the battle he would become an Islamite, by the will of God Rajah Soleiman was slain and his Fort taken. The Siamese prince became an Islamite in consequence of his vow and determining to settle here, directed his people to search for a proper place to built a new city [1].

Now there was a Paing man named Pa Tani, who lived on the sea shore, the place of his residence was chosen for the site of the new capital, which was called Patani from his name. Chow Sri Bangsa sent Aukan Pul, as ambassador to Malacca to request that Mahmud Shah would confer on him the nobuts. The ambassador and his letter were received at Malacca with the same ceremonies observed with those from Pahang. The letter was thus worded :—"Peduka the son sends his Sambah to his father, the illustrious Sultan, the favoured Lord of the earth, the revered shadow of God, the ruler of the universe." Sultan Mahmud was highly pleased with the letter of the king of Patani, the ambassador was favoured with a dress of honor and seated next the chief Bentara. The Khali Menawa was ordered to prepare a letter for Patani and Sultan Mahmud sent the nobuts with other necessaries to instal the king of Patani under the title of Sultan Ahmed Shah. Sultan Ahmed begat Rajah Siam and Rajah Aji. The Rajah of Keddah at this time came to Malacca to request the Nobuts from Sultan Mahmud. The king of Keddah was graciously received and seated on the Royal bench. Now it appeared one day that the Bandahara sat in his hall attended by the Tamoñgong and all the Mantris, a repast was served up and after the Bandahara had finished eating all his guests commenced, for it was not the custom for any one to eat with the Bandahara. During the time the Bandahara was eating, the Rajah of Keddah arrived on a visit, he was invited into the hall and seated with Tun Hasan, the Tamoñgong. After the Bandahara had finished eating and had taken Siri, the remains of his repast were drawn away by Tun Hasan, the Tamoñgong and other Mantris, who now commenced to eat, Tun Hasan inviting the Rajah of Keddah to join them, to which the latter agreed. The Bandahara said

" don't let the Rajah eat of my leavings," but the Keddah Rajah said, " Never mind, for the Bandahara is an old man and as it were my father." Now the Rajah of Keddah eat of the leavings of the Bandahara. After staying sometime at Malacca the Rajah of Keddah took leave and returned home, bearing the Sultan's permission to use the Nobuts. At this time Malacca was most populous, merchants congregated from all parts. From Ayer Lelah to the mouth of Moar river and from Campong Kling to the mouth of the Penajah was a continuous bazaar, one sailing from Malacca to Jakra had no occasion to take fire in his boat, for all along the beach there were houses. From this side round to Batu Pahit it was the same [2], for at that time the number of people of Malacca was 19 laksas (190,000.)

There arrived a Feringhy ship from Goa to trade at Malacca. Now the Feringhis saw the beauty of Malacca and that its ports was crowded (with ships). The people of Malacca assembled to see the strange people and were astonished, they said these are white Bengalies. Tens of the Malacca people crowded round each of the Feringhies, some twisted their beards, some felt their heads, some took their hats and some held their hands. [3]

The Captain of the ship went to visit the Bandahara Sri Maharajah and was adopted as his son by that chief. The Captain presented a gold chain set with gems, which he himself placed on the shoulders of the Bandahara. On seeing his movement in doing this, the people surrounded the Captain and sought to slay him, but were stayed by the Bandahara, who said, " don't mind him for he does not understand our language."

When the proper season arrived the Captain sailed for Goa, and on arriving there reported to the Vizier the greatness and populousness of Malacca. The Vizier of Goa at that time was Alfonsa Zalberkerki, and feeling a desire to possess himself of the country, he prepared 7 ships, 10 long gallies, and 13 pusats [4] and placing them under the command of Gonzalo Pereira, sent them to conquer Malacca [5]. When he arrived at Malacca a cannonade was commenced, the Malacca people were amazed at the noise like thunder, and still more at seeing the execution of the iron balls, some had their heads blown off, some were cut in two, some lost their shoulders and some had their heads broken. They examined the balls " what sort of an instrument of warfare is this, where is its sharpness, it is quite round but still it kills" [6]. The next day all the Portuguese, about 2,000 musketeers besides black troops, landed. Their soldiers were too numerous to mention. The Malacca men under Tun Hasan, the Tamongong, rushed on the Feringhies and drove them back to their ships, many were killed and the survivors returned to Goa.

When they reported their failure to the Vizier, he was enraged and ordered a fresh expedition to be prepared ; but Captain Mur, said he thought that as long as the Bandahara Maharajah lived, no force they sent, however large, could prevail against Malacca. Alphonso Albuquerque replied "why so? you say so,—alas! that I cannot leave my government here, but as soon as my Viziership is finished I shall myself go and conquer Malacca." At this time a ship arrived at Malacca from Juddah bringing a Pundit named Moulana Badarjuhan, who was extremely learned. The king himself was instructed by this Pundit and directed his son Ahmed to take lessons from him. One night the Pundit was at the house of the Bandahara engaged in scientific conversation with that chief when Sri Rama came in. Now Sri Rama was a drunkard, and at this time he was intoxicated. On seeing their occupation Sri Rama said " come along, let me also take lessons" the Bandahara answered " come then sit down Orang Kayah." When the Pundit saw that Sri Rama was drunk and that he smelt of arrack, he said in Arabic " arrack is the mother of all uncleanness." Sri Rama answered this observation also in Arabic saying, " Folly[7] is the mother of all uncleanness, have you yourself not come down here from the windward to look for profit from folly" (of others). The Makhdum was exceedingly angry and left the house, in spite of the efforts of the Bandahara to detain him, saying to himself, " Why am I called a humbug?" The Bandahara now said to Sri Rama, "Why, you are drunk, Orang Kayah, I hope the king won't hear of this, for if he does you may be sure he will be exceedingly angry," (at the insult to the holy Mahkdum). Sri Rama answered " let the king please himself – what harm is there in a hasty speech." Supper was now served and after eating Sri Rama returned home.

The next day the Bandahara went to visit the Makhdum, who was exceedingly happy to see him. Tun Meh Ulat Bulu, was at that time taking lessons, his proper name was Tun Meh Aldin, son of Tun Zeinlabdin, grandson of Bandahara Peduka Rajah, but on account of his being covered with hair he got the name of Ulat Bulu (hairy worm or caterpillar). The Makhdum found his scholar very difficult to instruct, as his Malayan tongue could not follow the Arab in pronouncing words of his language. He said "this Tun Meh's tongue is excessively hard, what I say he says differently, he cannot pronounce words." Tun Meh answered " true, oh Makhdum, but remember it is a foreign language and you yourself experience the same difficulty in pronouncing Malayan words." The Makhdum answered, " what difficulty is there in Malay that I cannot overcome." Then returned Tun Meh " say kuching" (a cat) " kushing" says the Makhdum, " wrong, oh Makhdum, now say kunyiet (turmeric) " kuzeet" says the Makhdum, and for Nyior (cocoanut) the Makhdum said Neeru. Now says Tun Meh, "whenever, oh Makhdum, you can pronounce Malay properly we will follow your instructions." The Makhdum was wroth and said " I renounce teaching Tun Meh any longer" [8].

Sultan Mahmud wished to send to Passé to propose a question as to topics of discussion started between the Arab theologians and those of Khorazan and Irak. The Bandahara advised that the ambassador should learn by heart the substance of a letter, so that it might not be necessary to commit any thing to paper, as the Passé readers were in the habit of altering words in letters sent to the king of that country, reading sambah in many cases where salaam was written. This advice was followed and Tun Mahmed, the ambassador chosen, sailed for Passé. On arriving there he was asked for his letter, in order that it might be received with due form and escorted to the palace on an elephant as usual. Tun Mahmed answered " I am the letter,—escort me" and he was escorted [9]. On arriving in the presence, Tun Mahmed recited the words learned by him for purpose as follows :—" May the good wishes and prayers of the Paduka, the elder brother, arrive in safety to the Paduka the younger brother, the illustrious Sultan, the magnificent of the earth, the revered shadow of the God of the whole universe. Now the Paduka the elder brother has sent me the Orang Kayah, Tun Mahmed, with the Mantri Sura Deepa, to the presence of the younger brother to propose these points. Whoever asserts that God the most high, ever to be praised, is the creator and preserver (provider of bread) to eternity, is a Kafir (unbeliever or infidel), and whoever asserts that God is *not* the creator and preserver to eternity, is a Kafir". The king of Passé assembled all his learned men, informed them of the Malacca question and begged that they would give the required answers, but not one of them could gives a satisfactory solution of the difficulty. The king then sent for Tun Hasan and requested him to answer the point, so that Passé should not be disgraced. Tun Hasan on hearing the point said " oh ! if that is all, the solution is easy," now Tun Mahmed said " come near" and Tun Hasan went close and whispered[10] the answer to Tun Mahmed who was much pleased at hearing it, and took leave to return to Malacca, where he was graciously received by his sovereign, who was greatly delighted with the account given of the embassy. Tun Ahmed was a son of Sri Amar Bangsa Tun Abu Said, grandson of the Bandahara Putih and great grandson of the Bandahara Sri Dewa Rajah.

NOTES TO 32ND ANNAL.

1. This account is not much to be depended on, as it is very unlikely that Patani should have remained independent after the Siamese had so often marched through it to attack other states more powerful and farther distant, Patani being the most northern of the Malayan states. It is not improbable that the country was a Siamese province, known to the Malays as Kota Maleegei, a corruption of the proper Siamese name and that about this time it became independent and was settled by Malays, who gave it the name of Patani, not from the fanciful reason assigned in the annals, but probably from a Hindoo origin, perhaps the verb patna, to irrigate, in allusion to the extensive rice cultivation. The reason for the victory of the Siamese, an infidel, over the Kota Maleegei, a Mahomedan sovereign, requires no comment.

2. These places are not marked on any of the maps I have seen. Kampong Kling is probably situated at the modern Tanjong Kling about 7 or 8 miles farther up the coast from Malacca. This Batu Pahat cannot however be the Rio Formosa of the Portuguese, as the annalist says it is on the other side of the Peninsula, most probably it is the Batu Pahit alluded to in annal XIII as the place to which the Siamese had advanced in their march against Malacca. The Moar or Muar river appears to be about 30 or 40 miles from Malacca on the south shore.

3. The Portuguese do not, as far as I am aware, mention these circumstances, nor indeed does it appear that Malacca was visited previously to the arrival of Sequeiro, unless perhaps by Vartomanus who was at Pedir in 1504.

4. *Pusat* or *Fusat*, probably a misspelling—there is no Arabic or Persian word like this as written. It may be for سفينه Sufeenah a sort of long boat or galley used in piratical expeditions.

5. This probably alludes to the expedition of Sequeiro in 1509. The evil reputation of the Portuguese had already been known at Malacca from the Arab and Kling traders and Sequeiro was not well received, and in fact was driven out of the harbour, after losing many of his people. After this he went to Portugal and gave such a flourishing account of Malacca that Emanuel the king sent out an expedition under Diego Mendez, but on arriving at Goa, the Portuguese head quarters in India, Albuquerque detained the ships till next year, 1511, when he himself was enabled to accompany the force, which he increased to 19 ships, and 1,400 men, with which he arrived at Malacca on the 1st July 1511, after touching on the north coast of Sumatra.

6. This is sufficient proof that guns were not used by the Malays before the arrival of the Portuguse and in fact though often used in the translation by Dr Leyden, when describing battles, the word does not once occur before this.

7. The word used is حمق Hamk, stupidity, but the evident meaning of Sri Rama justifies the translation given first as "folly"—and in the second instance when the Pundit is going away—"humbug."

8. This passage about Tun Meh is thus rendered in the translation published under Doctor Leyden's name. "As you cannot acquire perfectly the language of all us Malays here, in like (sic) we shall never be able to acquire your language truly. Then Mokhdim Sader Jehan was angry and said, I renounce teaching Tun Mia the hairy caterpillar."

We may be perfectly satisfied that this is not the translation as written, but probably is a careless curtailment from the manuscript which at this place may have been illegible. Doctor Leyden would have delighted in giving the fullest version of the dispute between the Makhdum and Tun Meh, but here, as in almost every page of the translation, we have to regret that the work was not published under his own correction. Sir S. Raffles apparently never read the Sejara and beyond writing the introduction the work owes absolutely nothing to his correction and in fact it might have been better published under a less able hand, as he did not even take the trouble of correcting the grammatical errors, and numerous obvious mistakes which must have struck his notice had he ever gone over the proofs before printing. The manuscript as left by Dr Leyden may have been written in an illegible hand, but the corrector might have informed us what portions he omitted on this account.

The task of pointing out the errors noted here is invidious and the writer has contented himself with supplying defects to the best of his ability without in each case pointing out the deficiency.

9. The Malays are exceedingly particular in attention to ceremonial in royal correspondence. There are established forms allowed to each court and according to these the dignity of each is estimated. When a letter is to be written, a council is called and after deciding on the subject, a priest (as being the best educated) is directed to commit the matter to paper to which the seal of the king is attached in different positions, according to the rank of the party addressed. A messenger or ambassador is now fixed on, whose rank is determined by the degree of honour to be shewn to the party to whom he is to be sent. A prahu or many prahus, according to rank, are prepared and an elephant or many elephants fully caparisoned drawn up at the palace gate. The letter is now brought out, attended by officers as before, according to rank, and placed on the chief elephant and a procession formed to convey it to the boat or boats, attended with music and banners flying. In like manner on arriving at the place of destination, intelligence is conveyed to the King that an ambassador bearing a letter has arrived from such a court. On this a

procession with elephants, music and flying banners, is arranged and sent to the landing place to receive the letter, which is placed on an elephant and escorted to the palace. The degree of the procession, rank of the nobles, number of elephants, banners and musical instruments is determined according to the rank of the king sending the letter. On arriving at the palace in full court, the letter is read by a Khatib (preacher) generally chosen for his good voice and talents in reading, all the nobles standing, if the sender of the letter is of sufficient rank. After the reading is over the ambassador is received and seated among the nobles according to his rank and conversation commences. Some of the Malacca nobles, the Bandahara for instance, when sent to Pahang was seated beside the king. This account will explain the meaning of Tun Mahmed when he asked to be escorted as the letter.

10. More sufyism;—the annalist being afraid or ignorant does not let us into the secret.

33rd *Annal.*

The Bandahara Sri Maharajah, had a daughter named Tun Fatimah, of most excellent conduct and of exceeding beauty, but Tun Hasan the Tamoñgong was of equal beauty and excellence; they were celebrated in song. Tun Fatimah was betrothed to Tun Ali son of Sri Nara de Rajah. When the time arrived for the ceremonies of marriage to be performed the Rajah of Barah was invited to the Bandahara's house and saw Tun Fatimah. The Rajah of Barah [1] was uncle of Sultan Mahmed and brother of Sultan Alaoodin, the deceased king, and when he saw the Bandahara's daughter he asked if the king had seen her, the Bandahara answered "No." Then the Rajah of Barah advised him not to marry his daughter to a person of low rank, but to wait and let the king see her, as at that time Malacca was without a queen, the Permeisuri of Pahang being dead and it is the custom under these circumstances for the daughter of the Bandahara to become queen. The Bandahara replied, "I am a low person, it is proper for me to mix with low people," so he determined to carry out his project of marrying Tun Fatimah to Tun Ali.

At the proper time the king was invited to the house of the Bandahara that his daughter might be presented to him previous to her marriage. The king arrived and the marriage procession of Tun Ali also came. When the king saw Tun Fatimah he was astonished at her beauty and instantly conceived a passion for her, and at the same time was enraged at her father, saying to himself, "What an old wretch is Pa Mutaheir not to shew me his daughter who is so beautiful." The ceremony proceeded and the couple were married, afterwards the king went to the palace but could not eat from love sickness. He now sought opportunity against the Bandahara. In due time Tun Fatimah presented her husband Tun Ali with a daughter named Tun Trang.

There was a Kling, Rajah Mandlier, who resided at Malacca and became Shahbander, this Kling was very rich, no one could compare with him in Malacca. One day the Bandahara asked him how much gold he had and was answered 5 Bahras, on which the Bandaharas said "oh if that is the case I have a Bahra more than you" [2]. The Bandahara was very fortunate in trade, he never lost. Sometimes he would call his children, (grand children &c.) and give them each a handful of gold to go and play with. When they went out to hunt, if they were unsuccessful on their return they would stop at the Bandahara's cattle farm and killing each one a buffalo, would send a quarter to the Bandahara, who on enquiring from whence the meat came would be informed of the behaviour of his young kinsmen and sometimes he used to say "oh! these lads go a hunting and when they get nothing in the forest they take to hunting my buffaloes." When his slaves came into town dressed up in silk and muslin the Bandahara would invite them into his hall and ask who they were, on which they would inform him "I am so and so, the slave of the Bandahara and son of so and so." They were so numerous that he did not know them. One day in the palace, when waiting the appearance of the king, Rajah Mandlier addressed the Bandahara and was repulsed by him for want of knowledge of etiquette in attempting to salute him in that place, before he had himself paid his respects to his Majesty; the Kling slunk back ashamed at this rebuke.

There was in Malacca a Kling merchant extremely rich, named Ali Menu Nayen. All the young nobles visited him and he was in the habit of giving them presents; but Tun Hasan the Tumongong did not visit him. He therefore one day asked Tun Hasan if he would not come to his house that he might present him with something as he did to all the other young nobles. Tun Hasan answered, "Nayen, am I a base born slave that you wish to bestow charity on me? If I was of a different descent (less nobly born) it might be as you propose." When the young men were short of money, they sometimes represented to Tun Hasan the Tumongong, that the market place was not regular, some of the shops jutting out and that if the king passed that way he would be displeased, on this account they begged he would grant them authority to see that the line was straightened. Armed with authority they would go to the market and levy contributions from the people under pain of having their shops pulled down in order to make the line straight.

There was a Kling named Nina Sura Dewan[3] who was the chief merchant in Malacca, he had a difference with Rajah Mandalier and they went to the Bandahara to settle the matter. It being late in the day the Bandahara desired them to return in the morning. That night Nina Sura Dewan thought to himself that he ought to go and see the Bandahara and give a present as Rajah Mandeliar was a very rich man, and if he makes a present to the Bandahara I will certainly lose my case. Accordingly Nina Sura went to the Bandahara and gave him 10 catties of gold to buy betel with[4]. There was a Kling man, a relation of Nina Sura Dewan, named Kitool who owed one catty of gold to Rajah Mandeliar. This Kitool went that night to Rajah Mandeliar and informed him that Nina Sura had been with the Bandahara and presented him with 10 catties of gold, and that he was now plotting with the Bandahara to kill him (Rajah Mandeliar). In return for this information the debt of one catty of gold due to Rajah Mandeliar was cancelled and Kitool took his departure. Rajah Mandeliar collected a quantity of jewels and fine cloths and taking a Bahra of gold went and presented these things to the Lacksamana, for that chief and his followers (clan) were favourites of the king and men of great influence in Malacca in those days. Rajah Mandeliar presented his gift to the Lacksamana and informed him that he knew the Bandahara meditated treason, that he had already in his house a throne and regalia prepared and that he intended to usurp the sovereignty. The Lacksamana informed the King, who was glad of an opportunity to wreak his vengeance against the Bandahara, on account of his not having given him Tun Fatimah in marriage, and at once ordered the Bandahara to be put to death by Tun Sura and Tun Indra Sakara. When these two with a body of attendants arrived at the Bandahara's house, they found all his friends in arms to resist the execution of the sentence of the king, but were ordered by the Bandahara to lay down their arms and go home, so that they might not commit treason by resisting the commands of the king. They went away and the Bandahara Sri Maharajah with Sri Nara de Rajah, Tun Hasan Tumongong, and Tun Ali, the husband of Tun Fatimah, were put to death by the executioners of the king[5].

There was also a son of Sri Nara de Rajah named Tun Hamza, who was wounded by Miasamy a Bengali, but on orders coming from the palace to spare one to keep up the lineage, Tun Hamza was preserved and taken care of till he recovered. He afterwards became a great favourite of the king. After the Bandahara and Tun Ali were killed, Tun Fatimah was taken to the palace and shortly after married by the king. All the property of the deceased Bandahara was confiscated and on examining it none of those insignia of royalty spoken of by Rajah Mandeliar were found. This induced the Rajah to make fresh enquiries into the business and the treachery of Rajah Mandeliar and Kitool was fully discovered. The king having by this time repented of his cruelty to the family of the Bandahara, ordered Rajah Mandelier to be put to death and his house razed to the ground. As for Kitool he and his whole family were impaled and his house rooted up and thrown into the sea. The Lacksamana was punished for his share in the translation.

Peduka Tuan, the son of Peduka Rajah, was made Bandahara. He was very old and infirm and strenuously opposed his being appointed as he was unfit for duty; but the king insisted, and when his presence was required at the palace His Majesty sent and had him carried and laid down in his place. From this he acquired the name of the Bandahara Lubok Batu[6]. The Bandahara had a very numerous family, all born of one mother, and at that time his children, grandchildren and great grandchildren amounted to seventy seven persons.

Tun Fatimah was married by the king and became queen of Malacca, but although the king was distractedly fond of her she refused to return his love, remained dejected and sad with the recollection of her father and husband murdered by the king, who now in vain sought her love. Finding all his attempts to that end in vain Sultan Mahmud became melancholy, he now deeply repented having so cruelly put to death the Bandahara and his relations, and the recollection of this deed affected him so much that he at last abdicated in favour of his son Rajah Ahmed and retired to Kayu Aru in the interior of Malacca[7] accompanied by Sang Sura alone. While there he kept himself retired from all society.

The new king Ahmed had no regard or respect for the chiefs and principal men of the land, but gave himself up to the society of young favourites, who were allowed to be extremely insolent and took advantage of their position as royal favourites, greatly to the disgust of the more respectable body of the nobles. Tun Fatimah was called the great queen (Rajah perampuan besar) but whenever she became *enceinte* she caused abortion. The Sultan Mahmud remonstrated and she said "what use is there in my getting a son, as you have already a successor on the throne." On this Sultan Mahmud promised that if she gave birth to a son he should succeed to the throne, and the queen from that time allowed her children to live. The first was a daughter named Rajah Putih, followed by another, also a daughter, named Khadijah[8]. Sultan Mahmud at this time was deeply engaged with the Makhdum Saderjahan in the study of Sofyism.

NOTES TO 33RD ANNAL.

1. *Barah* بارة probably the Baru, the next river south of the Lingie in Malacca.

2. 5 *Bahras.*—The Malacca Bahra is 3 piculs or 400 pounds, 5 Bahras=32,000 ounces; at 15 dollars an ounce equal to Dollars 480,000, for the fortune of the Kling, and dollars 576,000 for the Bandahara.

3. *Dewan.* A steward.

4. The bribery of course is plain, but we must remember the customs of the country which do not brand bribery of this sort with the infamy attached to it among us. The term betel here is equivalent to snuff—that is, betel is used in the same way as snuff is with us, to express a thing of no value, as "I never took as much as a morsel of betel" (sirih sakapur) "I dont care a morsel of betel (we would say "a pinch of snuff" about it"

5. This story of the intended treason and crimes of the Bandahara, is only an excuse brought forward by the annalist (who wrote at a time not distant enough to give expression to his feelings on this subject), as it is very evident this disgraceful murder was commited by the king in order to obtain Tun Fatimah. The same king had already murdered his brother Rajah Zeinal, (see XXX annal) and afterwards his son Ahmed (see XXXIV annal). His after punishment of the intriguers against the Bandahara, may be attributed perhaps to a natural revulsion of feeling, but judging from his character, most probably from a regret at having paid such a price, at the risk of public opinion, and without gaining his object, the love of Tun Fatimah.

6. *Lubok Batu.* This ought to be lubang لوبڠ a hole, the other word Batu means stone, in the next annal this Bandahara dies and is buried at Lubok Batu and from thence is called the Datu of LubokBatu; here the term lubok لوبق is correct, it signifies the bend opposite the point in a winding river.

Kayu Aru, at the foot of Mount Ophir—kayu means wood, and aru a species of tree growing near the sea shore, the casuarina litorea of Marsden—but probably aru is an error for ara, the name of different species of the fig tree.

8. *Khadijah.* The name of Mahomed's first wife whom he placed among the 4 perfect women; the other 3 being the sister of Moses, the mother of Jesus and his favourite daughter Fatimah, afterwards married to Ali.

34*th Annal.*

It is related that when Alfonso Albuquerque retired from the Viziership of Goa, he went to Portugal and sought an audience of the King, to recommend that an expedition should be fitted out against Malacca. The king of Portugal gave him 4 large ship carracks, and 5 long gallies with which he sailed to Goa and then prepared a strong force in addition, consisting of 3 ships, 8 galliasses, 4 long gallies and 16 pusats, altogether 43 vessels[1], with which he sailed to Malacca. When Sultan Ahmed heard of the arrival of the Portuguese at Malacca, he prepared to meet them in the defence of his throne. The invaders commenced their attack with a cannonade, they threw in showers of balls which fell like heavy rain. The noise was like thunder, and the fire like lightning, the sound of the musketry was like peas being fried. The Malacca men were driven from the beach by the hot fire from the ships and the Portuguese landed in their gallies and pusats. On this the Malacca men advanced again to oppose them, and a desperate engagement took place. The king appeared mounted on his elephant,—Tun Udani was on the neck with Tun Ali on the croup and the Makhdum was brought to balance the king's weight in the opposite pannier,[2] for he was at that time engaged with the Makhdum in studying the doctrine of the unity of the God-head.

Sultan Ahmed followed by many champions advanced to the landing place to meet the Feringhies. They were broken and driven back into their boats and the cannonade commenced afresh. The king stayed at the end of the landing place, heedless of the balls which fell thick as rain, but the Makhdum held the pannier with his two hands and at last ventured to say "oh Sultan this is not a place to discourse on the unity of the godhead, let us retire" the king smiled on observing the perturbation of his instructor and soon retired to his palace. The Feringhies now cried out from their ships—"Recollect, oh ye Malacca men, that we will land again to-morrow (by God)" to which they received for answer "very well." A strict watch was kept on shore, the warriors remaining in arms all night. Many of the champions and young nobles collected in the guard room and said among themselves "what shall we do to keep ourselves awake all night—are we to sit in silence, better let us read some warlike history so that we may gain information." On this Tun Mahmud said "very

51363

true, better let Tun Indra Sakara go and ask for the history of Mahamed Hanefiah [3], let him tell the king that from that work we wish to derive knowledge which may be useful in to-morrow's encounter." Tun Indra went and told the king all his message, on which the history of the Amir Hamza [4] was given, with a message that he would have given the history of Mahamed Hanefiah but he feared they would not imitate the courage of that hero in the expected battle of the morrow, he would however be satisfied if they acted like the Amir, the history of whose deeds he now sent. When Tun Indra brought the book and repeated the message the youths were all silent, till Tun Yusuf said—"it is better that you return and tell the king that he has spoken amiss, and that if he wishes us to act like Mahamed Hanefiah we will all be like the great Beniyar champion" [5]. When the king heard this he smiled and said "very well, here is the history of Hanefiah."

The next morning the Feringhies landed and were opposed by the Malacca men, who headed by their king fought desperately and were on the point of driving them into the sea, when a re-inforcement of one thousand European matchlock men, headed by Alfonso Albuquerque in person, arriving on the scene of action—by a well directed volley turned the tide of victory. The balls from their muskets fell in showers like peas on a sieve and by a fierce onslaught the Malays were broken and retreated, leaving their king alone on the field of battle. Sultan Ahmed was instantly surrounded by the Feringhies and wounded slightly on the hand, on which he shouted "oh ye Malays behold your king wounded." When the Malays heard this, they rushed furiously upon the Feringhies, 40 of the picked champions of Malacca were slain with many of the common people, but in vain, and Malacca was conquered. From the sea shore the Feringhies quickly made their way into the palace and Sultan Ahmed fled with many of the Malacca men. The Bandahara was being carried off by his friends when he earnestly entreated them to allowed him to amok it amongst the Feringhies, but not being allowed (he was crippled) he said—"Fye! all you young men are cowards, why am I thus palsied. If I am a man I ought to die here with Malacca."

Sultan Ahmed retreated to the head of the Moar and remained at Pagoh[6] and soon after built a fort at Betayin.[7] Sultan Mahmud was at Batu Hampir[8]. The Feringhies remained at Malacca where they staked off a space of ground and built a fort. They soon however advanced against Pagoh which place they took. Sultan Ahmed retiring further inland at last went to Panarikan.[9] At this place the Bandahara died and was buried at the Lubok Batu—from thence he is called the Datu of Lubok Batu. From Penarikan, Sultan Ahmed, accompanied by his father, went to Pahang where they were received by Sultan Abdal Jamal [10] with affectionate kindness. Sultan Mahmud bestowed his daughter by the princess of Kalantan, on the Rajah of Pahang, called

Sultan Mansur Shah. From Pahang Mahmud went to Bentan and Ahmed built a town at Kupek.[11]

Sultan Ahmed's behaviour was faultless in every respect but one;—he did not sufficiently attend to and respect his great men and nobles, but was guided by favourites who were exceedingly insolent, mocking and insulting the great nobles when any of them came to court, jeering at and mocking them. Sultan Mahmed heard of his son's deportment in this respect and was much displeased. At last he directed the decree of God to be carried into effect, that is to say, when one's time is come it can neither be hastened nor delayed[12]. Sultan Ahmed died and was buried at Bukit Batu, whence he is called the Marhum of Bukit Batu[13] When Sultan Ahmed died his son Rajah Mudhaffer was placed on the throne. The new king was a minor, and was placed by his grandfather under the instruction of a tutor, with many of the young nobles of Malacca. The place where the young king sat in school was distinct from the others;—first a coarse mat was spread in the highest place in the room, round this was placed a tapestry and another mat on which was placed the Putrana[14] on which Rajah Madhafer sat. The king gave in marriage to Rajah Mudhafer, Tun Trang daughter of Tun Fatimah (the queen) by Tun Ali and from this union a son was born named Rajah Mansur. Tun Kwojee Hasan, son of the Bandahara Lubok Batu, was made Bandahara by Sultan Mahmud, with the title of Peduka Rajah, and Tun Abu Sahān, son of Orang Kayah Tun Abu Sayed, was appointed Ferdana Mantri, with the title of Sri Amar Bangsa. Tun Hamza (the son of Sri Nara de Rajah, who was spared in putting to death the family of the Bandahara Sri Maharajah) was made Panghulu Bandari, with the title of Sri Nara de Rajah. Tun Hamza was a great favourite of the king —no one was like him at that time. Tun Biajid Rupat, son of the Bandahara Sri Maharajah and Tun Omar, son of Sriwah Rajah, were appointed to be Mantris, with the titles of Sri Utama and Sri Patam. Tun Mahmud brother of Tun Hamza was made chief of the Bentaras, with the title of Tun Narawangsa &c. &c.

The Lacksamana Kwojee Hasan died and was buried at Goapanter[15] and Hang Nadim became Lacksamana. He it is who was so exceedingly celebrated in war. It is related that he received thirty four wounds in actions with the enemy[16]. The Lacksamana had a numerous family, his eldest son was named Tun Mat Ali.

Tun Fatimah the queen was now again enceinte and in due time produced a son who was named Rajah Ali, and who afterwards received the title of Sultan Ala-aldin Rayait Shah. He was called the Sultan Mudah.

When Sultan Ahmed died, the Sultan Mahmud assembled all the courtiers and addressed them to the effect that they ought not to be concerned for the loss of the late king, for that now things would go on exactly as before. They all submitted themself to the authority of the king, except Tun Ali, who said “ as for me I am an old servant of the throne, but it was the late king who made my fortune (membaiki patih) and to whom I am attached, if he had died on the field of battle of course I should have accompanied him in death, but I cannot transfer my allegiance to another and if the king pleases he can now put me to death.” When Sultan Mahmud heard the saying of Tun Ali he was grieved and attempted to alter his determination. He used all manner of arguments, but at last finding his endeavours of no avail, Tun Ali was put to death [17].

NOTES TO 34TH ANNAL.

1. In the text the addition amounts only to 40.

2. *Pannier.* Mukhdum debawah Baginda bertambul ringga برتمبل رڠݢ, ringga is a pannier used on the backs of camels, but the Malayan elephant howdah is sometimes, if not always, made in the form of panniers slung one on each side, bartimbul means properly to raise to the surface, to float, but the evident meaning here is that the Makhdum was placed ·n the opposite pannier to balance the weight of the king.

3. *Mahomed Hanifiah,* is said to be the son of Ali. It could not have been Hassan, as he retired at the death of his father to a religious life near the tomb of the prophet at Medina. Houssein was the second son. He distinguished himself at the siege of Constantinople, and on the death of Ali prepared to assert his rights to the Khalifat which had been usurped by Moawiyah. In the contentions between the parties, Houssein was advised to go to Cufa where he would be received by a large force of his party with whom we might advance against Yezid the Khalif, son of Moawiyah. On arriving at Arbela, on his way, attended by only a few of his immediate friends, Houssein was surrounded by 5,000 horsemen sent by the governor of Cufa and slain. Yezid, though advised to exterminate the family, allowed Houssein's son to live and to the 9th generation this family continued to enjoy the respect and veneration of the faithful under the name of the 12 Imams. The last of the 12 Mahadi concealed himself in a cavern at Baghdad and finally disappeared. It is believed that he will reappear to overthrow the tyranny of Dejal (the imposter.) The history of Hanefiah is translated in the Malay language but I have not read it, nor indeed am I certain of the correctness of the supposition above, as Ali may have had a family by another wife. Hanif حانف means bandylegged, also, one of the Hanifa or orthodox sect of Mahomedans. Hanifa al Noman, the founder of this sect, was not born till A. H. 80, A. D. 700, so he could not be the great champion alluded to, exclusive of his being a man of peace.

4. *Hamza,* uncle of the prophet, being youngest son but one of Abdul Motalleb. He was killed in the battle of Ohod near Medina in the year of the Hejira 3. Hamza was a great champion of the faith and his deeds of arms are known to Malays by a translation from the Arabic.

5. *Beniyar.*—If this is not the name of a country or place, and I know of none such—I should suppose it to be from Beni Son and Yar, intimate friend, in allusion to Hanefiah being the son of Ali the intimate friend of the prophet.

6. *Pagoh* is one of the villages in the modern state of Segamet on the Muar river.

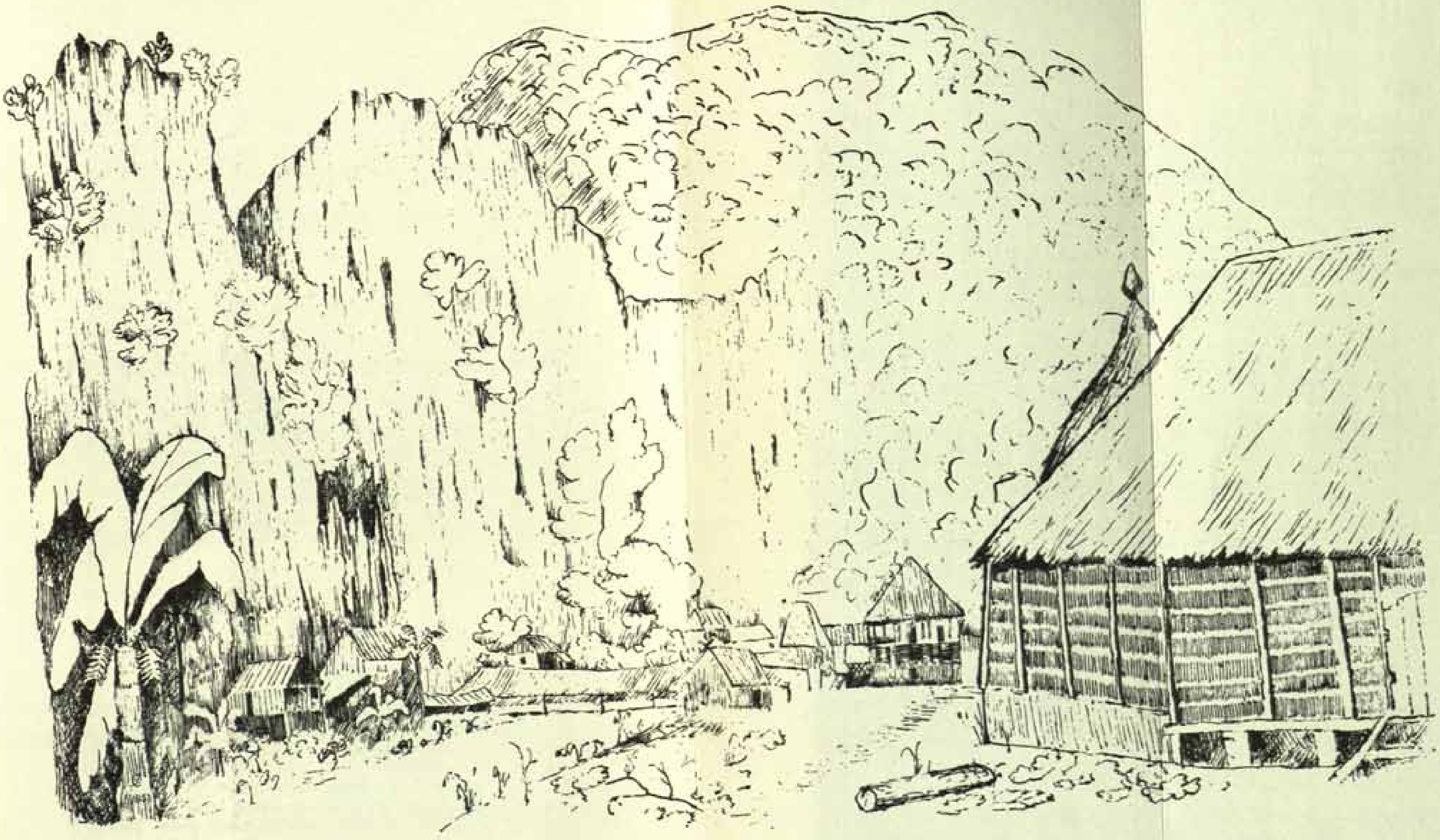
7. *Betayem.*—The position of this place is not defined in any of the works consulted on the subject of geography,—Raffles, Marsden, Begbie, Newbold, &c.

8. *Batu Hampir* is in Rumbowe to the north and west of Nanning. Batu means stone, rock, and Hampir near, nigh to—there is another word Hampar to spread, both written همڤر but the first appears to be the one used here.

9. *Panarikan* in Jumpole to the west and south of Pahang.

10. The monarch who abdicated—see last annal.

11. *Kupek* perhaps Kobak, (the sounds of b and p being almost alike.) in Sungie Ujong between Jumpole and Salangore.



Village of Bacuit N.W. Coast of Palawan

Singapore Lith Free Press Office

12. This is a curious mode of announcing a deliberate murder. The reasons assigned for putting Ahmed to death are too frivolous to require attention. We may be permitted to assign motives easily discerned from the narrative. Mahomed hastily resigned his seat (not the power, as we see the management of affairs still rests with him) in favour of Ahmed, whose sons of course would have succeeded. but Mahomed to gain the love of Tun Fatimah had promised to make her son, if she bore one, heir to the throne, and the readiest mode of effecting this object was to put to death Ahmed. Sultan Mahmud put to death his brother Zeinal from jealousy of his popularity and superior personal attractions (see annal XXX) the Bandahara Sri Maha Rajah, Tun Ali his son-in-law and two others from lust to possess Tun Fatimah (see annal XXXIII) and now he puts his own son to death in order to secure the succession of Tun Fatimah's son, who afterwards reigned under the title of Sultan Alaoodin Rayait Shah, to the exclusion of Rajah Mudhaffer, son of Ahmed, who appears only as occupier of the throne under the tutelage of Mahomed till Alaoodin was of age to take possession.

13 *Bukit Batu.*—The only place of this name I know of is in Sumatra, latitude 1° 25' North, nearly opposite Malacca.

14. *Patrana*—Chair of state.

15. *Goapanter* دكوا فنتر I can discover no locality bearing this name—it may be for دكوا فنتر de kota pintu, at the gate of the fort.

16. This is the Hero who commanded the naval attacks made by Mahomed against the Portuguese at Malacca. His name has been handed down by the early Portuguese writers as a skilful warrior and a man generally whose talents would have done honour to a higher degree of civilization. Great confusion exists as to these Lacksamanas, on account of that being the title of an office and not, as has been supposed, a personal name. There are three Lacksamanas whose deeds have formed subjects for the historian; the 1st flourished in the end of the 15th, the 2nd in the commencement of the 16th, and the 3rd in the beginning of the 17th centuries. The first is the Malayan hero Hong Tuah who accompanied Sultan Mansur to Majapahit about the year A. D. 1400. The second led the attacks made by Mahomed from Bintan and Johore to recover his kingdom from the Portuguese, about the years 1512 to 1522, and the 3rd was an Achinese who was taken prisoner at one of the great sieges of Malacca carried on by Iskander Muda of Acheen about the year 1628. The deeds of these three have been sometimes attributed to one man.

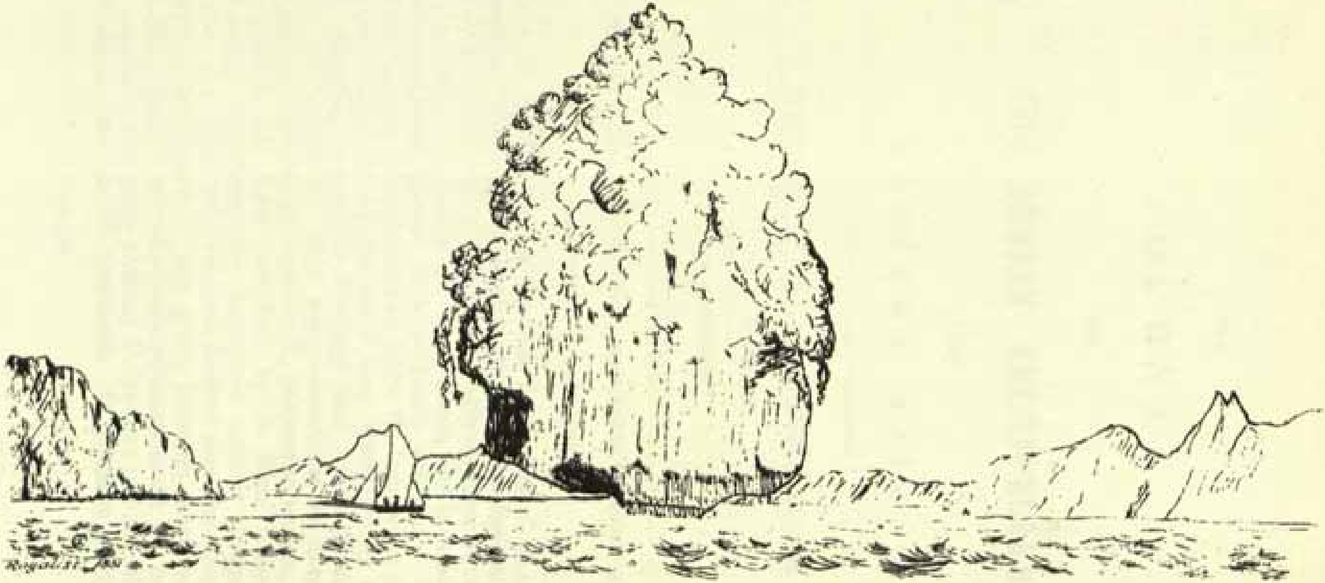
17. This is a delicate way of informing us of another murder committed by Mahomed. Most probably Tun Ali, who was a great favourite of Ahmed, remonstrated and made a disturbance about his master's murder and it became necessary to silence him.

PALAWAN.

PALAWAN, the south westernmost island of the Philippine group, is a long, narrow strip of land extending nearly southwest and northeast 250 miles, forming the eastern boundary of the China sea, from latitude 8.13 to 11.17 north. The western coast is often seen by navigators employed in the trade between India and China, as ships bound up the China sea late in the season, that is to say when the northeast monsoon is to be expected, usually adopt the "Palawan Passage" as it is called, which lies along the western coast of the island. This side of the China Sea is more sheltered during the northeast monsoon than the western or Asiatic side, which is invariably preferred by vessels making the passage with a fair wind, and by the mail steamers passing to and from China; the "Palawan Passage" being studded with numerous detached reefs, which render the navigation exceedingly unsafe, without the greatest precaution. Many of these reefs have been discovered and laid down by the commanders of country ships employed in the trade between India and China, but as these discoveries were made at different times, the *relative* position of these reefs with regard to each other remained to be fixed, before the Palawan passage could be considered as duly surveyed. It was to effect this service, as well as to ascertain if a better passage existed on the eastern side of the island, that the surveying ship "Royalist" was ordered by the Admiralty to take up the Palawan survey about two years ago, and we are indebted to an officer of that vessel for the accompanying sketches, which serve to illustrate the peculiar formation of this hitherto little known island.

The northern extreme of Palawan is a narrow peninsula about 60 miles in length, consisting of a mass of limestone rock, rising abruptly from the sea in precipices from 200 to 300 feet high. It is only in certain spots, where indentations in the limestone range have encouraged the formation of alluvial deposits, that landing places are to be found, and such is Baquit, on the western side of the peninsula, which is represented in the accompanying sketch. A small settlement has been formed there by an European Spanish merchant, who farms the trade of Palawan from the government of the Philippines. The settlement consists of an *attap* church, which is seen on the right of the sketch; a school house; the residence of the farmer and a number of huts occupied by the native settlers. The chief occupation of the male inhabitants consists in collecting edible bird's-nests from the caverns in the limestone rock, the mouths of which are found in the precipices, and the ease with which the natives employed in collecting the bird's-nests ascend the perpendicular face of the cliff, with no other appliances than sandals of hide to protect their feet from the sharp projections of the rock is described as truly extraordinary, scarcely less so, indeed, than the feats of the Guanches, the now extinct aborigines of the Canary Islands.

The second sketch represents a singular islet near Baquit, also of limestone formation, the base of which has been so worn away by the wash of the sea that it is only supported by a comparatively slight stem, which in the course of time must break under the weight of the superincumbent mass, when the islet will topple over into the sea and form a dangerous obstruction to navigation. The precipices which bound the coasts of the northern peninsula of Palawan are indurated in a similar manner, sometimes to the depth of 20 feet.



Mushroom Rock NW Coast of Palawan

Singapore Lith Free Press Office

THE

JOURNAL

OF

THE INDIAN ARCHIPELAGO

AND

EASTERN ASIA.

ETHNOLOGY OF THE INDO-PACIFIC ISLANDS.

By J. R. Logan.

LANGUAGE.*

Chap. III.

Sec. 1st. COMPARATIVE CHARACTERISTICS OF EACH GROUP.

VII. North Indonesian.

The N. Indonesian are the most interesting of all the insular languages. They have a complex and highly intellectual ideology, which is carried out with so considerable a degree of consistency and so deeply penetrates all the dialects, that in relation to the other Asianesian groups it is evidently original. When we observe that the formatives found in the W. Indonesian languages,—which sometimes appear as if they were foreign trappings, little adapted to a crude ideology and which in reality are more often discarded than worn,—constitute an integral and essential portion of the complex N. Indonesian system, and have undoubtedly not been borrowed by it from other existing Indonesian languages, the important enquiry suggests itself whether the latter may not have derived these particles from the former. The interest of this group increases when we further find that it has not only the closest relations to the W. Indonesian, but possesses also many striking Polynesian traits of which there is hardly a trace in W. Indonesia. It possesses nearly all the formatives of the other groups, it has some which are peculiar to itself, and it enjoys a wonderful and unparallelled range of relational expression through its power of combining them. Its definitive, demonstrative, possessive, directive, pronominal, and formative systems abound in flexional or quasi-flexional traits which with the complex formative prefixes, impress a very marked and distinctive character on its speech. An ideology so elaborate and peculiar cannot be properly understood without numerous illustrations, and we must therefore be satisfied with a few general comparative remarks in this place, but the reader will find in the Supplement the means of acquiring a more accurate knowledge of the genius of these remarkable languages, which appear to have hitherto escaped the attention of English philologists.

---

* Continued from vol. v. p. 585.

N. Indonesian is less harmonic and in its syllabic finals and junctions, though not in the combinations, more consonantal than W. Indonesian. It differs phonetically from that group chiefly in shewing less of the influence of the vocalic E. Indonesian, in having a tendency to final *g*, and in its liquids not possessing a definite character but passing into each other and even into guttural and vocalic sounds. The two traits are connected. *L* and *d* not only take the place of each other in some words, but both are not infrequently pronounced like a soft *r*, and in some dialects *l*, *y* and *r* are, to a great extent, commutable. It wants the strong vibratory *r* which is so marked a characteristic of a large group of languages in the middle of Indonesia, including many of Borneo, Celebes, Java and the trans-Javan chain. Occasionally it softens it into the other liquids *y*, *l*, or, like some of the W. Indonesian languages, replaces it by *gh*, but in finals it generally passes into the pure guttural *g* (e. g. *brat* Mal., *burat* Sund., ma*bigat* Tagalo, *bayad* Pamp.; *bibir* M., *bibig* Tag.; *ratus* M. *gatus* Tag.; *tidor* M. *tolog* Tag.) It wants *j*, *f*, *w*, *v* and *z*, but as *z*, *f* and *v* are found in Formosan and *v* in some of the Philipine and Bisayan dialects, it is probable that the present prevailing phonology is a refinement on an older and more aspirate one, possessed of all these sounds. A further remnant of this highly aspirate phonology is the use of *ch* for *d* and other consonants in some of the Negrito dialects of Luzon and in Formosan,—a Nias trait. Ng occurs frequently as an initial, as in Javan and its allies. It does not distinguish the dental from the palatal *t*, *d*, and it wants the sounds which have been borrowed by some of the W. Indonesian languages from the Arabic. Its vowels are limited to the simple sounds, *a*, *e*, *i*, *o* and *u*, but *e* and *i*, *o* and *u* are so permutable, that there cannot be said to be more than three decided vowels. The dipthongs *ai* and *ao* occur frequently.

In N. Indonesian phonology three main ingredients appear to be distinguishable. The first is of an archaic character with some affinities to the earlier Melanesian, the second is E. Indonesian, and the third is W. Indonesian. In later ages the two last have varied in their respective influences, but W. Indonesian has predominated in the most recent era. In the sequestered Formosan dialects both the E. and W. Indonesian ingredients are preserved in a ruder or more primitive form than they now possess in most other Indonesian languages, and it is through this ancient form that the phonology of W. and N. Indonesia is connected with that of Tobi and the allied eastern languages. It is worthy of attention that the highly aspirate character of one development at least of E. Indonesian phonology, is well preserved in distant and comparatively sequestered languages in all the great regions of Asianesia including Nias in W. and Formosa in N. Indonesia.

Structurally N. Indonesian has much power of euphonic adaptation in the junction of formatives with principal words and with each other, and in the union of definitives, directives, possessives, pronouns, &c. The monosyllabic coalescence of these particles produces numerous instances of pure flexion, for one of the elements is frequently represented by a single vowel or consonant. Many of these composite monosyllables may be found in the languages of other groups, but the N. Indonesian alone enables us to decompose them, by presenting clusters of particles in which the same mode of formation prevails. This is one of the many evidences of the originality of the Philipine ideology, and of the great influence it has at one time exerted on the other Malayu-Polynesian languages. Some particles are infixed, but the phonetic fluency and cohesiveness of the language is very weak compared with the E. Indonesian and it rather resembles the W. Indonesian, but with numerous traces of having been imbued in its nascent condition, with greater freedom. Other flexional traits occur in the formation of the companionative, the different forms of the pronouns, &c., which are sometimes produced by a simple change of the final vowel, and above all in the indication of tense by a variation in the initial of the active formatives. [*]

N. Indonesian agrees with all the other Oceanic, and we may add, the majority of the Continental, families, in the crudeness of its glossarial elements, which become substantival, attributival, transitive, personative, &c., by position and the aid of servile particles. The word itself remains crude. The phonetic expression of relation lies wholly in the particles, separate, prefixed, infixed or postfixed, aided frequently by reduplication of a portion of the word. The terms of European philology, when applied to this language, must, therefore, receive a logical and not a purely grammatical meaning. The Philipine *verb*, for example, cor-

---

[†] The compound particles having acquired the character of concretes like inflected words in the Indo-European languages, pleonasms are produced as in that family. *An* or *si* tavo, the man, nin [= *ni an*] tavo, of—the man, *ninsi* [= *ni an si*, tavo] of—the—the man. Less disguised pleonasms occur, as *kuci* Pedro*ng* oripon, *of* Peter'*s* slave, i. e. Peter's slave.

responds logically or ideologically with the English verb, because it serves the same essential purpose in speech, but grammatically it is not a pure word of action or assertion. It is a crude, a substantive, a qualitive or even a mere particle, clothed with particles which denote being, relations of action, transition, &c. Even if we considered the compound as a unity, it would not rise to the character of a true verb. The more the crude or the substantival notion accompanies us in exploring the labyrinth of Philipine ideology, the more correct are our conclusions likely to prove. In almost all cases the verb will be found to be in reality a substantive or qualitive, and its formatives directives similar in their nature to those used with pure substantives and indeed frequently identical with them phonetically. The same remarks will apply, with hardly any modifications, to all the other Malayu-Polynesian languages. In most however there are purely assertive words, affirmative and negative.

It is obvious from the above remarks that the ideology of N. Indonesian resolves itself into an examination of its relational words or particles, such as definitives, directives, pronouns, and formatives. In this class of words it combines the most lavish profusion in some directions with great poverty in others. It possesses distinct definitives for persons (including pronouns) and for appellatives, and it uses them as in Polynesian. The former has a companionative form which is a flexion of the singular. In the cruder state of the language the definitives must have occurred separately more frequently than they do now, when they are phonetically combined with directives, pronouns, adverbs, &c. These particles are thus complex definitives. The directives are few and highly generic, the same particle being at once possessive, ad-transitive, ex-transitive, locative and instrumental. But there are also exclusively possessive particles. Most of the definitive, locative and directive elements are also pronominal and formative elements. The pronominal system is more elaborate and complex than any other in Indonesia, but it closely resembles the Polynesian and Vitian. The principal elements are the same, and so is the general plan, but the Polynesian is more simple and consistent in its mode of forming the dual and two plurals. The N. Indonesian appears to have lost some of its original simplicity from dialectic changes. It also combines the definitives and directives with the pronouns, and in some cases has a superabundance of elements, which again are compounded, so that the actual number of distinct forms is much greater than in Polynesian, although the latter has a refinement of its own in a double possessive, and the dual is not well distinguished in most of the Philipine dialects from the plural exclusive.

N. Indonesian is distinguished less by the great number and variety of its formative particles, than by the complex manner in which they are compounded and the minute discrimination with which they are applied. It has not only definitive or substantival, personative, instrumental, attributive, transitive and intransitive, active and passive, causative, reflective and temporal particles or flexions, but by compounding and repeating the formatives in various combinations, single names are given to a multitude of those modifications of action and relations of substances, which most languages express paraphrastically when they express them at all. In this manner it expresses combined, assistive, simultaneous, alternate, intermittent, intensive, augmentative, remittent, imitative, simulative, spontaneous, intentional, involuntary, convertitive, frequentative, habituative, and continuative action; potentiality, causation, perfection, privation, action for another, incitement, solicitation, permission, command, possession, being, equality, similarity, &c; season, time, place, the point of commencing or concluding an action, the point to which action is directed &c. &c. Only two times are radically distinguished,—the future and the past. The present, which is always passing, is considered as an intensified past and so expressed. The imperative is the same as the future.

It is by its multiplex combinations of formatives that N. Indonesian stands apart from all the other languages of Asianesia. In W. Indonesian the combinations are, in general, limited to a single prefix and postfix, which often simply intensify the form. Such are a transitive prefix with the causative or transitive postfix, the intransitive prefix with the causative postfix, one of the substantival prefixes with the substantival postfix. Double prefixes, such as the intransitive and substantival, rarely occur, and the highest measure of combination is such a double prefix accompanied by a postfix. But the N. Indonesian by heaping and repeating its formatives, indicates active or passive, transitive or intransitive, single or associated, simple or complex, intentional or involuntary action, power, causation, permission, mandation, solicitation, privation &c. in the same word that expresses the actor or the other substantive and the time of the action. No other Asianesian language possesses words like makapagpapagigin*tinapay*, ipinagmamapala*sintah*in, all save the portions in italics being agglomerations of formatives.*

These extraordinary combinations arise from the extent to which N. Indonesian has carried the generic discrimination or classification of action, and as this distinguishes it from all the other Asianesian languages, and is the most conclusive proof of the originality of its ideology, a more particular account of the system is necessary.

The number of simple and composite prefixes and the complex ideas which they express, render them, at first sight, difficult to be understood. The chief source of the difficulty consists in many of the ideas being not only different from those which in our own language have been raised to generic power, but of so little comparative importance in our ideology that we have not even named them. We have neither inflections, affixes, nor single words to represent them; and some are so little recognized by us that even when defined we cannot readily familiarize our minds with them. When we analyse them, however, and ascertain the force of each elementary particle, the complexity disappears.

---

* We have seen however that in Australian compounds of a different kind are still longer.

While it is in general laborious rather than difficult to ascertain the more essential and generic powers of the different particles, approximately at least, we soon find that in the application of each there is little adherence to one abstract idea. Each appears to have originally possessed a determinate meaning, or to have represented a certain class of ideas, but to have been gradually extended not so much to a higher and more abstract sense, as to successive classes of ideas or relations having some natural analogy to the primary class. This process has even gone on to a limited extent since dialects were produced, for in some of these there are peculiar uses of particles. Sometimes their powers have become restricted instead of being enlarged. The new applications are occasionally so different from the general character of the old ones, that we can only conjecture upon what principle of association they have been founded. When the different powers of a formative are thus loosely connected, ambiguity is a necessary consequence. It sometimes happens that these peculiar uses do not proceed from the recognition of a new class of relations, but consist in applying the particle to a class found in the ideology common to all the dialects but which is represented by a different particle in the others. The matter for wonder is that when an ideologic system so complex is diffused over dialects spoken by tribes so rude, such misapplications are not more numerous.

The N. Indonesian pronominal system, as may be seen on reference to the Supplement, is founded on a different basis from that of European languages, or at least one that has not yet been recognised in the latter. The classification of action, on which the system of formatives rests, has likewise so much that is peculiar, that the ordinary distinctions of transitive, intransitive or neuter, and passive, are not sufficient to enable us to describe it. A more important and essential classification is based on the presence or absence of power, and a recognition of degrees in the intensity and complexity of action; and the object has more influence in determining the character of the action than the agent. The most generic division of actions depends upon the object being determinate or indeterminate, a distinction which also regulates the use of some of the directives. When the object is determinate the form of speech is passive or possessive i. e. the object is nominative and the agent possessive. When the object is indeterminate the form of speech is active, i. e. the agent is nominative and the object directive. The formatives differ in the two forms of speech, and, as most objects are determinate, the passive is far more used than the active.

Of the other divisions of action that are recognized in N. Indonesian ideology the most important refer 1st to presence or absence of an object and the relation between the agent and the object; 2nd to differences in the power exerted or in the complexity of the action; 3rd to the relation between the action and the mind of the agent; 4th to relations of time; 5th to relations of place. Of these the first are of the greatest importance and involve most of the others. In the first class the following kinds of action may be distinguished by differences in the formatives. When there is no object to receive or excite the act, it is purely intransitive, and action thus considered as a mere attribute of the agent stands on the same footing as qualitives. The sleeping or walking, the size, colour and character of a man, have the same formatives. Simple transitive action, in which the act is single and may be considered as taking its origin spontaneously in the agent, without being incited or intensified by the object, is the 2nd degree. In the 3rd the agent is considered as subordinate to the object, as in *solicitation* where it is really so, or in *eating* where it is so because it exerts a power over the agent and causes or intensifies the act. The discrimination of this class of transitives is one of the most remarkable traits in N. Indonesian ideology. It belongs to the archaic basis of the language and is too refined and complex to be found in the cruder Indonesian tongues. In most of the applications of the formatives appropriated to this class there is an external active or potential object so that it is *quasi* reciprocal as well as transitive. We may designate it complex transitive or objecto-transitive in contradistinction to the simpler kinds of transitive or agento-transitive action in which the object has no relation to the agent save as object or recipient of the act. In the complex transitive the object first acts on the agent and is the primary incentive or cause of the action, as in *buying* in which the article purchased raises the desire to acquire it and induces the purchase, in *teaching* where the agency of the learner is as essential as that of the instructor, in *giving* which implies an act of acceptance by the receiver, in *imitating, simulating, permuting,* where the object of the act leads to it. In some uses of complex transitive particles as in denoting the acts of *spilling, scattering, putting in a place, sowing or planting,* &c., the object does not first act on the agent but the action is still complex, the object becoming detached from the agent and assuming an active power in producing a secondary or consequential effect. The water is first spilt and then strikes the ground, the article is first carried or moved and then deposited &c.

In the 4th degree the two parties are each agent and object as in all kinds of reciprocal and *quasi* reciprocal action. Reflective action is considered as *quasi* reciprocal. This class of transitives may be designated *agento-objective*.

The 2nd class of distinctions relates to the degree of power exerted. The differences in intensity or energy embrace simple action, potentiality, causation, conversion, perfection or completeness in the action &c. Complex action being considered as the result of increased power stands on the same footing with it. It may consist in plurality or multiplicity in the agent, in the object or in both. It comprises various kinds of associative action, some of which are reciprocal. When the plurality is in the object, there is, in some cases, a distinction between action affecting numerous objects collectively and that affecting each separately. When the agent acts for another it is considered as complex and the action is distinguished by particles belonging to the complex class.

The 3rd class of relations are those between the action and the mind of the actor. To this belong the formatives denoting voluntary and involuntary action, that which leads to unintentional results, expectation, inclination, addiction, &c.

The 4th class of relations, or those to time, embrace actions continuative, frequentative, intermittent, alternative, gradual, &c. With these may be associated the distinction between the beginning, the middle or progress, and the completion of an action.

The relations to place embrace the formative expression of the direction of action towards a place, or towards the speaker; of the point where it begins or ends; of transfer to a place; of exposure to the influence of an external object.

Similar distinctions pervade both the determinate or passive and the indeterminate or active forms. In the former there are three distinct formatives, the application of which depends on the intensity of the action, the degree of complexity of the whole phenomenon comprised in the proposition, or the particular relation that is to be indicated. Hence there are 3 degrees or classes. 1st where the mere place or object of the action is indicated; 2nd where the relation between the action and object is simple; 3rd where the relation between the action and object is complex, from the intensity or complexity of the action or the exercise by the object of a powerful provocative influence on the agent. The formative of the first is the definitive for the subordinate class of appellatives, that for the second the definitive for the class of proper names in which superior dignity and power resides, and that for the third is compounded of the first and second. The first is purely objective and generally local or *quasi* local; the second is highly agentive, that is the agent is either principally regarded or the act is energetic or compound; the third is objecto-agentive, the object generally exerting a power over the agent.

The N. Indonesian association of actions is somewhat analogous to that of substances found in Chinese, Ultraindian, W. Indonesian and Polynesian, and it may be considered to approach still more closely to a scientific classification. The root expresses the individual nature of the action, and the different particles indicate with much minute discrimination its generic character and relations.

It must be borne in mind that the preceding remarks are merely explanatory of the kinds of generic discrimination on which the system of formatives is based. There is no rigid classification of action, with each class and subordinate division distinguished by its appropriate particle or combination of particles. Still the actual applications of the formatives have a general correspondence with the logical basis although the system abounds in marks of a rude and capricious workmanship. Some of the particles are applied to so many kinds of relations that although the nature of the root in general fixes the meaning of the compound there is much room for ambiguity. While the number of composite formatives is very great they are all built up of a few elementary particles. Every syllable is a particle and most of the monosyllabic particles are themselves composite. Their analysis however belongs to the history of the language. In its present state all the monosyllables and even many compounds of two or more syllables, may be considered as distinct particles. If the national mind had retained a sense of the distinctive powers of the various elements the system would have been comparatively regular and scientific. It is the loss of this sense that has caused simple and compound particles to branch off into numerous uses inconsistent with the primitive powers of the elements and in many cases not reconcileable with each other. In their existing uses some of the most important particles closely approximate and even coincide. It is obvious that such a system can only be understood by examining the various applications of each particle in all the dialects. In the supplement I have given in a list of the most important formatives the results of an examination of this kind directed to a Formosan, a Bisayan (Zebuan) and four Luzonian languages (Pampangan, Tagalan, Ilokon and Bikalan.) From a cursory examination of the Cagayan (Luzon) and Panay (Bisayan) they appear to agree in all essentials with the above dialects, and as these do so with each other, and the most northern and southern present only minor differences, it is probable that the dialects for which I am yet without materials, the Zambales, Pangasinan, Batanes and Chamorro, present nothing that can materially affect the conclusions I have drawn.*

We must refer to the Supplement for a view of the N. Indonesian formatives and their combinations. It will afford some idea of the elaborateness of the system when we state that 18 of the Tagalan formatives (simple and compound) take above 400 combinations. The different dialects furnish about 50 principal monosyllabic and dissyllabic formatives, chiefly compound, but there is a large number of important compounds of several syllables, and the total number of combinations used must be very great. The principal of the definitives and simpler formatives are the following. We merely give what appear to be their more generic powers. Their actual uses, and the variations of these in the different dialects, will be seen in the Supplement.

---

* Some remarks on the dialectic differences will be found in the Supplement. The most important peculiarities occur in Formosan and the Luzon language nearest and most resembling it,—the Pampangan.

Si def. for proper names (W. Indon.—In Pol. it occurs in the numeral *one*,—ta*hi*, ta*si* and the indef. article *se*, *he* is probably derived from it.)

Iti, *ti*, *te* def. for appellatives. *Ta* def. for proper names in Formosan. (*Te*, *ta* def. Pol. *Itu*, *eta*, *ta*, rel. def. W. Ind.)

Ang, *an*, appellative def. (Pol.) *An* is also used as a substantival postf. with a passive or privative force. As such it forms many kinds of words expressive of passivity, deprivation, inferiority, diminution, &c. When used in relation to action it indicates the place or object. It is also collective, as it sometimes is in W. Ind. In W. Indon. *-an* is used to form substantives as in Phil. In the vocalic Pol. *na*, *ñga* is also a substantive postfix and a passive element.

I is a passive transitive prefix, factive, causative, &c. It occurs as the personal or agentive def. in Pampangan, the other dialects having *si*. *Si* or *hi* must therefore be considered as the full primary form. In Pol. *I* is the transitive directive. In the dative it may be *ki* [the transitive *ko* + *i*?] corresponding with the Bikolan transitive ki [ka + i]. *I-* also occurs as a def. in W. I.

In, (*un*, *on*, *an*, *en*) is the complex transitive particle of the passive. (Jav. Pol.)

Ka- has received numerous applications generally, as in W. Indon., in conjunction with *-an* which appears to remove or qualify its radically transitive force. Thus it forms abstract, collective, companionative, equalitive, and locative substantives, and in combination with other prefixual particles has various powers, chiefly intensive. *Bansay*, beautiful, *ka*bansay*an* beauty; *arak* wine *ka*arak, a co-drinker of wine; *ka*buti equal in beauty; *talo* three, *ka*talo the third; *ka*talo *-an* the third part. *Ka* occurs with its substantival, abstract, and ordinal powers in W. and E. Indonesian and as a transitive particle or element in W. and E. Ind. and Pol. In Pol. it occurs as a subst. *postf.* in Marquesan, and as an agentive and transitive preposition (ko). The assertive particle *ka* (Maori, Paum.) is also evidently the same. In the other dialects it is *kua* in which it is probably combined with another element. This may be compared with the change from *kan* to *kuing*, *kui* in the transitive of some of the N. Indon. dialects. In N. Indon. *ka* alone is not an assertive particle but it enters largely into the compound active formatives.

Pa– is an active substantival pref. sometimes personative but more frequently instrumental. In Ilokan it is passive, in Formosan transitive and causative. (W. E. Ind. Pol.)

Na in all its applications has as its basis the idea of remoteness from the speaker. Locatively it means *there;* personally it is the third personal pronoun ; actively it imports time past,—its infixual form being –*in*–. It is found with its personal, locative and temporal powers in Pol. As a particle of action (but without the distinctive element of time) it is found in E. Indon. *Na*– is a def. prefix to the numeral 10 in some of the Pol. and N. Indon. dialects.

Ma is attributival and radically intransitive. It is also substantival. In its active uses it has an element of time being indicative of the future and imperative in most of the dialects. –*Um*– –*m*–, is the infixual form of *ma.*

Mi (*ma* + *i*) is an active and generally transitive pref.

Ga, g &c is an active and transitive element.

Kwi (*ka* + *i*) is transitive.

Kwin, Kwig, Kan, kag are particles compounded of *ka, i, an, g.*

Man, nan (euphonically *mang, mam, ma* &c) active, intensitive.

The more important compound particles are *naka, naga, napa,* and *nakwi. Naka* denotes the highest degree of energy in a simple action. It is hence perfective, potential, causative &c. *Naga* is applied generally to complex action. It is active, factive, augmentative, reciprocal, frequentative, continuative, alternative, correlative, companionative &c. *Napa* generally applies to lower degrees of complex transitive action than *naga.* In some dialects it is used where there is an intermediate agent, as in permission, mandation &c.

The prefixual letter of these and the other compounds having the active prefix *na,* becomes *m* in the imperative and future and *p* in the instrumental form,—thus *nan, man, pan*; *n*aka, *m*aka, *p*aka. The transitive *g* being postfixed, intensified and more decidedly transitive combinations are obtained, naka*g*, napa*g*, nakwi*g* &c. Many other simple or dissyllabic combinations occur such as *pagka, kapag, nagpa, nagna, nanki, nanag, mina, mipa,* &c; most of these, although in reality compounds, have acquired specific powers, but the combinations above three syllables are in general merely mechanical agglomerations, that is, each of the constituent particles, be it of 1, 2 or 3 syllables, retains the same power which it possesses when used separately. But this must be qualified by the remark that the initial or last added particle is the determinative one, that a particle is frequently reduplicated to express mere intensity, plurality &c., that *na* when it is repeated is often changed into *pa* to give euphony to the compound, and that some of the particles so closely approximate in their powers to each other, that in combinations they have often a simply intensitive effect or are merely euphonic.

All the words formed by these prefixed and suffixed particles remain crude. They become substantival or attributival from the context. Preceded by the definitives they are substantives; followed by other names they are attributive. Ex. Tag. *tolog* (root) sleep; *na*tolog, the act viewed as a whole, as completed, and hence *past*; na*to*tolog, the act extended or continued up to the *present* by the intensive form; *ma*tolog the act viewed as about to take place, *imperative*; *ma*totolog the extension or intensifying of this, the *future*; *ang* natolog he whose sleep is completed; ang natotolog he who continues to sleep; ang matotolog he who will sleep. Ang vino maoy *nagapaka*tolototolog kanimo, the wine causes-sleep. This is the active form. The passive is *gipaka*tolototolog*an*. In the first form *naka* or *paka* being by itself causative, the factive *naga* simply emphasises the expression if indeed its office is not merely to gratify the sesquipedalian predelictions of the Luzonian ear. The reduplication in the root *tolog* sleep makes the action frequentative. In the passive form the prefix *gi* is the passive of the present in the intransitive form. *Sulat* a letter, to write; s*m*ulat, s*um*ulat, imperative; *sungm*ulat, perfect; *sungmu*sulat, present; *mag*susulat, intensive. *Isug*, bravery; *ma*isug brave; *nagapakama*isug, to simulate bravery. *Aso* dog; *mang*aso, to hunt. *Rahay* good; *nagmamaroma*rahay, he who feigns himself good. The N. Indonesian collocation is that which is common to all the Indonesian languages and to a large extent to the Polynesian, which we have described under the head of W. Indonesian. The agent when a pronoun follows the action.*

N. Indonesian compared with the other Malayu-Polynesian languages.

On comparing N. Indonesian with the other groups, the conviction is forced upon us that they have derived much of their ideologies from it or from a mother system which is best represented by it. Its elaborate and in many respects complex development of relational particles,—definitives, demonstratives, directives, pronouns, formatives, &c,—is complete and in general self-consistent, and the dialective disintegration and corruption is not so great as to prevent our recognizing one primary ideologic system which has borrowed nothing essential from the systems now prevailing elsewhere in Asianesia, whateve,r it may have derived from older languages.

The varied applications of the formatives in N. Indonesian reveal the working of an intellect possessed of great vitality, and creative activity. In the formatives of the allied Asianesian languages there is hardly a trace of this high mental vitality. They offer no independent manifestation of a creative power adequate to the production of a system of formatives, while in N. Indonesian these very particles are not only found in company with others of a kindred nature, but are indued with refined applications and distinctions and formed into multiplex combinations, having on the whole a wonderful degree of consistency, attesting the originality and unity of the system and compelling us to refer the intellectual tendencies which created it to the single tribe, wherever placed, which first spoke the *proto*-Philipine language.

---

* I ought to mention that the above very imperfect generalisation of N. Indonesian ideology has been written before reading Humboldt's views in his *Kawi-Sprache*, which I only at present know from Dr Prichard's brief account of them in his Researches. Before concluding the present paper or revising the section on the Malagasi, I hope to be enabled to possess myself of the contents of the Kawi-Sprache.

While the ideology of N. Indonesian abounds in the strongest evidences of originality in reference to the other Asianesian languages, the number of traits found in all the other Malayu-Polynesian groups that are identical with N. E. Indonesian ones, and the absence in all these groups of any approach to the fullness and complexity of the N. Indonesian ideology, lead to the inference that they were at one period as deeply influenced by it as we have seen several of the languages of rude Peninsular and Borneon tribes to be by the Malay. This influence must have preceded the civilisation of the Javanese and Malays and the consequent spread of their languages. What its nature and extent were on the different groups will appear from the following comparative remarks. Let us first advert to the Polynesian which has long been withdrawn from direct Indonesian contact.

The Polynesian is essentially a distinct language from N. Indonesian, and cannot be considered as a descendant from it. It has many characteristics in common with all the Indonesian languages, which alone would prove it to have existed in Indonesia for a sufficiently prolonged period to assimilate it to this extent to the prevailing ideology of that region. But it does not exhibit a trace of that fundamental complexity and elaborateness which distinguishes N. Indonesian, its phonology is essentially different, and its vocabulary adds a mass of peculiarities to these proofs that it is a separate language. The N. Indonesian features must therefore have been derived from contact with a N. Indonesian ideology. The connection must have been of an intimate kind to induce the engraftment of the N. Indonesian pronouns and pronominal system, and several of its formatives on Polynesian. We cannot determine with any approach to accuracy what its accessions were, because we have no means of ascertaining the exact condition of Polynesian or its germ before it came in contact with N. Indonesian. It may have had primitive affinities with that language in some of its pronouns and particles, for affinities of that kind are found in languages very remote from each other both in place and character. But the number and kind of resemblances are such as to shew that at least a large portion of them must have arisen from actual contact.

Nearly the same remarks apply to the Indonesian groups. They have all assimilated in their general habits and collocation, but each group at least retains sufficient peculiarities to establish its primary independence. The E. Indonesian has well marked characteristics of its own in phonology, structure and vocabularies which prove that its languages are not derivatives from N. Indonesian. The striking affinities with the latter must therefore have been produced by contact with it. The W. Indonesian languages have a similar crude basis, and have not even the *quasi* flexional traits of E. Indonesian. They have therefore still less claim to be considered as descendants of the highly developed N. Indonesian. But some of them have more largely grafted its formatives than the Eastern languages, and the phonologies of the two groups have greatly assimilated, so that an appearance of primitive affiliation has been acquired.

In speaking of the influence of N. Indonesian on the other insular languages I do not mean to convey the impression that the tribes who inhabit the Philipines were the agents who exerted this influence, or that the language or languages spoken by the tribes who did were identical with any of the Philipine dialects. That the ideology was essentially the same cannot be doubted, but it may have possessed traits which have been lost in these dialects, and it is reasonable to believe that the latter have acquired something from the languages which their prototype so much enriched. It is even consistent with linguistic history to believe that amongst these languages there may be preserved some traits acquired from the primary N. Indonesian which have been lost in the Philipines.

Nothing connected with this subject is more remarkable than the contrast which the different groups, and even the various languages of the same group, present in the amount and nature of their N. Indonesian accessions. In Polynesian we find the definite article, the companionative, the dual, a close adherence to the essentials of the entire pronominal system, the particles of direction, &c. but the assimilation in these striking traits is accompanied by a very limited adoption of the formatives. In the W. Indonesian languages the formatives are more largely adopted, but the other characteristics are wanting. E. Indonesian again possesses fewer of these characteristics than Polynesian and more than W. Indonesian, while its share of the formatives is less than that of the latter group. These contrasts have probably been chiefly occasioned by two causes, difference in the closeness and duration of contact and difference in the tendencies of the assimilated languages. To these may be added the probable loss of some of the acquired traits. Some of the W. Indonesian languages appear to have possessed the definite article. That for proper names *si* is preserved in Javan and Malay, but is becoming obsolete in the latter. The demonstratives in many W. Indonesian languages are identical with the definitives of N. Indonesian and Polynesian and in Sundan the definitive is preplaced as in these groups. It is probable therefore that some at least of the W. Indonesian languages used the definite article at one period, and that the prevailing idealogy of W. Indonesia was too crude to endure the refinement, or received a backward tendency which induced a gradual return to its primitive simplicity. Traces also exist of the particles of direction, and not only the elements but some of the idealogic characteristics of the pronouns have been preserved such as the exclusive and inclusive plurals (*kami*, *kita* as in N. Indonesian), the possessive of the 2d person in *mu* and its reappearance as an element of the nominative plural, the faint vestige of the companionative in the plural use of the singular for the indication of associated persons. The Malay pronoun of the 2nd person *angkau*, *kau*, presents a curious relict of the era of N. Indonesian idealogy. The prefix *ang* is in full accordance with Philipine and Polynesian ideology, but in these languages *ang*, *a* is the definitive for appellatives and not for pronouns. This is a trait similar to the dialectic misapplications or divergencies which occur in Philipine itself, and it could only have arisen in a language which had acquired the habit of using the definitives prefixually. *Ang* has now no meaning or independent existence in Malay. But the possessive and relative definitive of Philipine produced by prefixing the possessive particle *n* to this article, is preserved in Malay as a relative,—*nang*. It is also preserved in the objective particle *akan* and transitive-causative *kan* which N. Indonesian resolves into a combination of *ka* (a directive found in Malay) and the def. article. The locatives, demonstratives and other particles afford similar instances, tending to prove a greater approximation in ancient times to the character of the Polynesian engraftments. This renders the explanation of the superior wealth of W. Indonesian in Philipine formatives more simple, for it may be attributed to a prolonged continuance of N. Indonesian influence. Why the formatives should have been better preserved than other traits is less easy to understand. It probably arose from their great practical utility in preventing ambiguity and circumlocution, the extent to which names formed by their aid enter into the vocabularies, the ready means they afford of naming new objects, operations &c., and the manner in which they are euphonically joined to roots.

It will appear from the preceding remarks that the relations of the N. Indonesian group to the other Malayu-Polynesian languages have a paramount ethnologic importance. I will therefore, at the risk of some repetition, compare its ideology with that of the other groups in a more detailed manner than I have adopted in the very brief and imperfect notes on these groups which form the preceding part of this chapter.

N. Indonesian compared with Polynesian.

Phonetically Polynesian differs widely from N. Indonesian, which is more consonantal than the other Indonesian languages. The only marked trait in which they agree is the convertibility of *l*, *d* and *r*. In the archaic phonologies of both *z* appears to have been an element, as it is preserved in Formosan and Rarotongan. *V* is also found in both. The vowel sounds are more numerous in Polynesian, and it possesses *f* as a distinct element from *p*. But it wants *b*, *d*, *g*, *h*, as well distinguished elements, while N. Indonesian possesses them. In structural phonology N. Indonesian is more advanced and agglutinative, but there are many traits common to the two languages, such as the frequent coalescence of two particles into a composite monosyllabic particle.

We have already noticed the principal ideologic characteristics, common to N. Indonesian and Polynesian. Such are the definitive articles for proper names[*] and appellatives,—the pronominal dual, companionative, exclusive and inclusive plurals; the indication of the direction of action in relation to the speaker; the distinction between an act directed to several objects collectively and to each separately; the position of the particle of possession before the possessor and after the subject of possession; the power of reversing this collocation by placing the possessor first;[†] the expression of frequency, multitude, intensity, &c., by a reduplication of the word or of its first syllable; the common plurals by a preplaced demonstrative and by reduplication of a connected qualitive; the substantival, attributival, active, passive, causative and potential formatives; a close similarity in numerous idioms, such as the formation of the ordinal from the cardinal numbers by definitive, substantival and transitive prefixes[‡], of the numbers between 10 and 20 by conjunctives (tekau *ma* tahi 11, i. e. 10 and 1 Pol. sangpolo *kag*saro ib. Bikoli, napulo *ug* usa Zebuan) of the tens by formatives (*hoko*rua, 20 Pol. *karuhaan* 20 Zebuan); the use of definitives and formatives with the cardinals, as in the above examples of *sang*, *na* used as prefixes, (*ka* is used when numbering in N. Ind. e. g. tolo *ka*tavo 3 men, in Pol. it is prefixed to the numeral, toka or tokotolu nga matapo, 3 blind men); the expression of present and future time by the same particle of action (in this agreeing with the more archaic N. Indonesian dialects Formosan, Pampangan); the use of *e* for the present and *i* for the past in some dialects, the indication of the past by the remote definitive and locative *na**; the use of the definitive for the present (Ilok. *idi*); a similar causative prefix†; the use of the passive transitive elements *i*, *in* in the reciprocal forms‡; the frequent use of the passive form of speech; the use of the same particle as a passive and substantival postfix§; the incrementive and intensitive use of the reduplicated form *ana*‖ &c. The Polynesian, from its use of the article, exhibits the crudeness of the Malayu-Polynesien words as strikingly as the Philipine. Thus words of action are made substantive by preplacing the article.¶

---

[*] In Pol. the personal pronouns are also preceded by the definitive. In Phil. they appear to have been so in the more archaic form, for the first syllable in several of the pronouns is a definitive. That *a*, or *an*, *ang* was at one time a definitive for pronouns in Indonesia appears by the Malayan pronoun of the second person kau, *ang*kau.

[†] In this case the possessive particle is postfixed and phonetically united to the possessor in N. Indonesian, but in Polynesian it is made to coalesce with the definitive article which precedes the subject possessed; in other words the subject of possession is removed to the end of the phrase while its definitive retains its place at the beginning. Thus *te kupu a te tangata* (N. Z.), the speech of the man; *ta te tangata kupu*, the of—the—man speech. We have seen that a similar coalescence takes place in the possessives of the pronouns, *taku*, *toku*, my (N. Z.) for *te a ku*, *te o ku*, the of—me.

[‡] *Te*, *ko* Pol. *waka* Maori, *ika* Zeb.

The N. Indonesian characteristics not possessed by Polynesian are numerous. The latter has merely a few detached fragments of the complex formative system of N. Indonesian. It wants the remarkable divisions of action on which that system is based; some of the simple and nearly all the numerous compound formatives and the power of combining them; some of the plural companionative and pronominal elements; the initial time flexions; the numerous quasi-flexional combinations of definitives, directives, formatives &c.; the formation of the companionative particle from the definitive; the personal definitive *si* (*a* which corresponds with the Philipine *appelative* def. *an*, being used as in Formosan). Amongst the simple formatives the most striking deficiency is in the personative and instrumental prefix *pa*, so common throughout Indonesia. It occurs however with its causative and transitive powers *va*, *vaka*, *paka*, *whaka*, &c.

On the other hand Polynesian has some remarkable traits not found in N. Indonesian, such as the plural formed by elision of the initial consonant of the singular in the compound article *t*etahi S. *e*tahi P. and demonstratives *t*aua, aua; *t*ena, ena &c.; the distinctly definitive plural *nga* (Maori), the Philipine *mañga*, being adverbial and not definitive; the more frequent use of locative particles to indicate the degree of proximity of the place of action to the speaker; the double possessive; the simple and regular system of forming the pronominal dual and plurals by post fixing the numerals *two* and *three*; the generic or segregative words; the agentive particle as distinguished from the definitive; the use of both these particles together, and, in some dialects, of both the proper and appellative definitives before names of persons[*]; the indication of time by the definite article (used assertively as in many other ideologies) and the locative of distance (which is also an element in the 3rd personal pronoun and the demonstratives). Some of the Polynesian formative traits are also peculiar. Such is the distinct expression of an action and its result; the causative *ta;* the desiderative particles. Some of the assertive and temporal particles of Polynesian are peculiar, e. g. the article *e* present, future, contingent; the frequent use of *ka* as an assertive of the present and future; the use of *ana* as a postfix with *e* prefixed to denote the present[†]; the use of *kua* (ku + the def. a?) as a past assertive, but it may be related to the past *gi* of Phil. (passive); of *kia* generally a passive prefix &c. The position of the agent after the action appears at first to be a very remarkable peculiarity, but if the explanation I have offered of it (*ante* vol. v. p. 234) be correct, as I believe it to be, it is identical with the common N. Indonesian passive or possessive form of speech in which the agent follows the verb. The same idiom is much used in W. Indonesian. The action word is to be considered as substantival or participial and as referred possessively to the agent.

---

* The imperative and future *ma* is not Pol. but *me* is sometimes used in the imperative in Maorian and the prep. *ma* is the future form of *na*.

† *Pa* is also potential in Tongan. In Maori *whaka* sometimes implies "the *becoming*, or the *being like to*, or the *feigning* or *exhibiting* the root to which it is prefixed" (Maunsell p. 159.) The Philipine *naga* and *naka (paka)* are applied in a similar manner. It is also used to denote reciprocity, inception and gradual declension.

‡ The Pol. prefixes *fe* and postfixes *faki*, *ani*, &c.; *fa* does not occur as a postfix in N. Indonesian, but it is used passively.

§ In Pol. the passive is sometimes distinguished from the substantive by the omission of the nasal, e. g. patu, patua, patu*nga*.

‖ In the E. Polynesian dialects *nga*, *na* retains its most passive sense, generally denoting the result of an action, while *anga*, *ana* denotes the action itself. In Hawaiian *ana* appears to have had an incrementive force as e. g. tul*ana* a place where many things stand (from *tu* to stand.)

Tauci au *te tu* atu nei, here (am) I *the* (person) *standing* towards (you.)

The more important of the N. Indonesian particles found in Polynesian are the definitive for proper names and pronouns (Tongan and N. Zealand) and that for appellatives (Iloko) altered in accordance with the curt and vocalic phonology of Polynesian; the subst. and attribut. *ma*–; the pronominal elements; the demonstratives; the possessives in *n* and *a*; the dative (and objective) particle in *k*;[‡] the Maorian plural particles (of which traces exist in other dialects); the particles of direction in relation to the speaker; the combinations of particles such as the directives and possessives with the definite article, of the latter with locative particles, (to form demonstratives,) with pronouns (in Polynesian with the agentive particles); the incorporation of conjunctive, possessive, companionative or plural particles with pronouns;* the causative prefix (*paka*, *waka*); the passives *i* (*ina*, *ngia*, *fia* &c), *na*, *ana*, *nga*, *anga*; the qualitive *ma* (*na*) sometimes used to form adjectival substantives as in N. Indonesian.

---

[*] N. Indonesian preserves traces of having possessed a similar power of using two articles, and for an analogous purpose. Thus, in Bikoli, *nin*, of—the, if the object has not been mentioned before, but *ninsi*, of—the—the, if it has. The *si* is a more determinative particle than *an*, and is in most dialects appropriated to proper names and pronouns; in other words *an* is generic, *si* individual.

[†] But *ana* here appears to me to be merely the passive *ana*, so that the form of expression is participial, *e kite ana* ahau i te tangata, the seeing (of) me to the man; so in Malay *kalihatan* aku, my seeing.

[‡] In Polynesian it has the form *ki* in the dative and *i* in the objective and ablative (ex-transitive, instrumental). If the *ki* and *i* are the same particle, its range of application is nearly as great as the N. Indonesian *ka*. It is probable however that *i* is a distinct particle corresponding with the N. Indonesian definitive *i* (Pamp. Ilok.) which again appears to be a contraction of the more common *si*. *Ki* would thus be a compound of the kind so frequent amongst the N. Indonesian and Polynesian particles, *ka* or *ko*-+-*i* or *ki*. *Ko*, equivalent to the N. and W. Indonesian *ka*, occurs in N. Zealand, and it is also found in all the Polynesian dialects as the locative *there*, which brings us probably to the proximate root of

The affinities between the Polynesian and N. Indonesian suggest several questions. Is Polynesian the archaic and ground form of N. Indonesian, is it N. Indonesian in a state of declension and impoverishment, or is it a separate language that has been deeply influenced by N. Indonesian? If the last is the case, are its N. Indonesian traits entirely referable to the present condition of that language, or do they point to a more archaic one, and what was the character of Polynesian itself prior to its assimilation to N. Indonesian?

Polynesian is more monosyllabic, less agglutinative and less complex than N. Indonesian, but because it is thus more crude and archaic, even in traits common to the two languages, it does not necessarily follow that it exhibits N. Indonesian in an imma-

---

the directive, and explains why it embraces dative, ad-transitive, ex-transitive and instrumental or causative, and has also become an action-formative expressive of transition and causation. All these relations are based on the common one of a space or distance separating the source from the terminus of motion or action, the *ko*, there. The different ideas proper to its several applications have been gradually imported into the particle in the progress of language from a primary or crude state analogous to the Chinese to that in which it now exists, and definitives have entered into combination with it. In Malayu we can recognize it in the particles *ka*, to (locative); *akan* (combined with definitives), to (objective); *kan* causative and transitive postfix. In N. Indonesian it is found unchanged in *ka*, *kanila*, *kari*, &c. Zebuan, *kada*, *kadagiti*, *kaduaka* &c. Ilokon &c. &c; it combines with the definitives in the directives *kan*, *kuen*, *kuing*, *kui* (the nearest to the Polynesian *ki*); and it is used as a substantival and verbal formative with many applications. We may proceed a step farther in the dim region of primitive ideology and identify *ka* there, with the 2nd personal pronoun, *ka* you. In the Supplement some remarks will be found tending to shew that the 2nd and 3rd personal pronouns are primitively based on notions of relative distance from the 1st, so that *you* corresponds with *there*, and *he* with *yonder* in relation to *me*. There can be no doubt of this in the case of the 3rd personal pronoun, which in many of its forms, N. Indonesian and Polynesian, has a locative element, and the locative origin of the 2nd person is confirmed by observing that in N. Indonesian the directives &c. as well as the pronoun have the vowel *a* while in Polynesian both have *o*. The element *ka* in the plural inclusive of the first, and the plural of the second person (*kami*; *kamo* or *kamu*) in the demonstratives *kari*, *kana* &c. appears to be the same particle. The rationale of its appearance in the first person inclusive probably consists in the person or persons nearest me (by locative or by social connection) as distinguished from those not so connected although present, being the objects singled out by the pronoun and indicated as attached to me the speaker by the conjunctive *mi*. *Ta*, which is radically identical with *ka*, is found in N. Indonesian as a definitive, the remote locative and a plural and possessive element in pronouns.

* All these combinations are archaic and dead, Polynesian no longer possessing a plastic power over its vocabulary like E. Indonesian. N. Indonesian has also lost much of the agglutinative power which it appears to have at one time possessed.

ture or nascent form. If the Polynesian was an independent tongue, with a comparatively crude character, at the time it came under the influence of N. Indonesian, its acquisitions from that language would be affected by its own ideology; and if the process of assimilation was interrupted at a stage considerably prior to complete conversion, the N. Indonesian element would be more likely to receive the colour of the native one than to prevail over it. The comparative simplicity therefore of the Polynesian will not establish the hypothesis of its being the parent of N. Indonesian, or a representative of a condition through which that language passed, unless it is supported by other facts. But the general character of the language gives no countenance to this hypothesis. It is hardly possible to conceive that a phonology like N. Indonesian has sprung from one like Polynesian. This objection cannot be met by the violent supposition that while N. Indonesian has changed in so many other respects, it has preserved the archaic phonology while Polynesian has lost it, because this only substitutes one improbability for another, and is moreover irreconcileable with the fact that the words and forms common to the two languages have in general a similar phonology. The common definitives, pronouns, formatives, numerals &c. are nearly all similar. The archaic phonology of these at least was vocalic and therefore Polynesian more than N. Indonesian. Glossarially the two languages are to a very great extent separate, and the phonetic contrast between the purely N. Indonesian and the purely Polynesian or Malayu-Polynesian words is decided. Indeed as respects phonology Polynesian associates itself with E. Indonesian and even with W. Indonesian far more closely than with N. Indonesian. There only therefore remains the ideology which so far from counterbalancing the phonetic and glossarial objections to the hypothesis, would alone suffice to prove that Polynesian is neither the parent nor the child of the N. Indonesian. The latter is one of the most elaborate, refined and complex languages of the formative class, while the former is essentially one of the most simple. The former is so homogeneous that all its most marked tendencies must be referred back to its inchaote or normal condition. The language has grown as one consistent whole under the operation of these primitive tendencies and they are consequently manifested not in isolated traits but in numerous phenomena that rise up in all directions as we pursue our researches. Now in Polynesian we do not detect the leading ideas and tendencies which form the physiological character of N. Indonesian. We only observe isolated traits identical with N. Indonesian, and which we cannot refer to any fundamental law prevailing in Polynesian ideology. If these had been of native growth the identity would hardly have been so complete and so uniform, and the generic ideas in which they originated would have been represented in many other kindred traits.

Take for instance the remarkable companionative form found in Polynesian as well as Philipine. That it is original in the latter and derivative in the former, is proved by the idea on which it is based recurring in other forms, simple and compound, in Philipine but not in Polynesian. Some of these forms are so strongly marked that if they had originated in any other Asianesian language, it could not have entirely lost them. The associative notion on which they all rest pervades Philipine ideology, while it cannot be recognized as a fundamental and generative idea in the other insular tongues. Thus in Philipine the substantival prefix *ka* is extended from a simple transitive to an associative meaning. With the passive subs. postf. *an* it forms such words as *ka*kahoy*an* a plantation from *kahoy* a tree. By itself it receives a peculiar and curious application of the associative idea. While the companionative formatives of Philipine, Polynesian, &c., denote a person and his companion or companions, *ka* denotes the companion alone. Thus from *laro* play, comes *ka*laro a playmate. The compound formatives, *naga*, *nagaka*, *nakwig*, *nasig*, *nagahi*, *nakwi* and others have various associative powers, some being very striking. Thus *nagahi* (Zebuan), or *nagsi* (Tag.) may be used to express association in the agent and singleness in the object, *nagsi*sisulat sila, all write to one.

To the question whether the N. Indonesian traits of Polynesian are entirely referable to the present condition of that language,—in other words whether Polynesian affords any evidence of N. Indonesian having changed since the former was cut off from connection with it, it may be answered that Polynesian has carried away so little of the complex ideology of N. Indonesian that it cannot present a just criterion of the state of that language at the era of separation. But as the forms and offices of most of the Polynesian particles are similar to what are still found in N. Indonesian, the evidence, as far as it goes, is against the supposition of that language having suffered much change. It is probable that the agglutination of the definitives with the pronouns and directives was then less advanced.

The question as to the character of Polynesian prior to its contact with N. Indonesian is one of the ultimate ones of Asianesian ethnology, and we must reserve any attempt to answer it till we have compared the other Indonesian languages with the N. Indonesian.

E. Indonesian compared with N. Indonesian.

The Indonesian languages differ so considerably amongst themselves that a full comparison of them with N. Indonesian would require a separate notice of each, and for this there is not room here. We have seen that the phonetic characteristics of E. Indonesian ally many of its languages with Polynesian and others partly with Polynesian and partly with W. Indonesian, while they distinguish it greatly from N. Indonesian. Structurally many of the languages are more agglutinative than N. Indonesian but the compositions are different. The agglutinative power of N. Indonesian is chiefly exhibited in certain kinds of union between some classes of its particles, while the roots or substantive words themselves are rarely effected by the prefixed or infixed particles, the changes in the initials being confined to a few invariable kinds. The typical E. Indonesian has not the N. Indonesian composite particles, but it possesses in full activity and far greater energy the agglutinative power which produced these. In it alone of all the Malayu-Polynesian types can we recognize phonetic fluency and adhesiveness as an essential and living principle. In the other classes of language we find some fixed euphonic habits rather than a plastic euphonic power. N. Indonesian has more habits of this kind than W. Indonesian and is therefore nearer E. Indonesian, but there is no evidence or probability of its ever having possessed the phonology of the latter, much less of its having originated it. We should rather be compelled to refer the euphonic habits of N. Indonesian and Polynesian to an E. Indonesian influence if they could not be otherwise explained. E. Indonesian has fewer N. Indonesian traits than Polynesian. It wants the definite articles, the companionative particles, the pronominal dual, the time signs and idioms, the causative paka, (faka, waka)* common to Polynesian and N. Indonesian but with them it possesses the particles of direction.

Most of the E. Indonesian languages are very deficient in formatives. In this respect also Polynesian is somewhat nearer N. Indonesian. The N. Indonesian *ka* is more closely represented in E. Indonesian than in Polynesian. It is used prefixually, with a substantive and also an attributive meaning. *Pa, ma, na* and *i* are found in E. Indonesia (ante Vol. v. p. 242). The prefixual *wa* of Lietti appears to be the N. Indonesian *pa* (Pol. *wa, fa,*) used with one of the complex-transitive powers of N. Indonesian. *Am-* appears to be intransitive like *ma-* of N. Indon. The passive and transitive *i* does not occur as a pure action particle in Lietti, but in the formation of substantives from words of action it exerts a passive or quiescent power in the infix *nia, ni, n, i*, and in the passive personative pref. *ri*. The active personative *mak* is the N. Indonesian *maka* which is a substantive as well as an attributive pref. and with a causative force. The possessives *ne, ni, enne* are closely allied to the N. Indon. In the other southern languages *ma, na* occur. *Pa* is active in Sumba as in Formosan. The passive *-na* of E. Timorian is the passive *-an* of N. Indon. *-na, nga* of Polynesian. Bugis has subst. *a—ang* corresponding to N. Indon. *ka—an*. It has also *pa* personative pref., *la* personal def. (Tongan), *ma* attributive and subst. as in N. Indon. and Pol.,

---

* But see the remark on *mak* (*infra*.)

-*i* transitive and causative, and *ni* a particle of the past. All the deficiencies of Polynesian as compared with N. Indonesian are shared with E. Indonesian, and it also wants most of the non-Philipine ideologic features of Polynesian which have been mentioned above. Several of the formatives in E. Indonesian languages have every appearance of being exotic and of having been borrowed, indirectly or directly, from a N. Indonesian system. They are very little used in most of the languages and their powers and office vary, but they always retain some portion of the N. Indonesian meaning. They are always restricted to some simple and single office, and the refined and peculiar ideologic distinctions which they represent in N. Indonesian are lost. It cannot be conceived that the *maka* (with its flexions *naka* and *paka*) of N. Indonesian which is an essential portion of a complex system and is composed of two particles, both of which are much used as elements in other formative combinations, can have been derived from the restricted *mak* of Lietti, or that if the latter had been a genuine daughter of N. Indonesian it would have discarded all the more important and generic functions of *maka* and retained no trace of the influence the particle at one time had on its whole ideology. While Lietti has adopted the verbal form and given it a limited personative sense, Polynesian has taken the personative or instrumental form and given it a generic active sense. Each in a different way is a partial representative of the N. Indonesian particle, and each contains an error of a kind that constantly occurs when particles are borrowed from a foreign language by a people who do not fully understand its ideology.

While E. Indonesian has few of the flexional traits common to N. Indonesian and Polynesian, it has many quasi-flexional features of its own induced by its agglutinative power, and some of the languages are distinguished by one of the highest flexional traits, the pleonastic union of the pronoun and verb.

It thus appears that E. Indonesian has no phonetic or ideologic resemblance to N. Indonesian save in the common Malayu-Polynesian characteristics and in a few formatives applied to some simple and partial uses. It appears also that Polynesian, notwithstanding its close phonetic and glossarial affinity to E. Indonesian, has more N. Indonesian features than that group. The reasons for not considering Polynesian as directly related in the ascending or descending line to N. Indonesian apply more strongly to E. Indonesian. By its phonetic peculiarities which ally it to a class of phonologies totally different from the comparatively crude W. and N. Indonesian and Polynesian, by its vocabularies, by the absence of a formative ideology like N. Indonesian, and by the want of most of the ideologic traits common to that language and Polynesian as well as of those that are peculiar to the latter, E. Indonesian, in its more typical languages at least, vindicates its right to rank as an independent development. Its present basis is a phonology having well marked native peculiarities but intimately allied to the Polynesian, and an ideology closely akin to the simpler W. Indonesian but with slight vestiges of a N. Indonesian influence. There is no evidence that the southern E. Indonesian languages ever approximated very nearly to N. Indonesian, or had the prolonged and intimate association with it which Polynesian must have enjoyed. The obvious explanation of this is that Polynesian or its Indonesian prototype was spoken by tribes locally intermediate between N. Indonesian and the present E. Indonesian tribes and which were deeply influenced by both. If the ethnic limits of the two Indonesian peoples have not greatly altered since the emigration of the Polynesian stock, linguistic probabilities would point to some portion of the northern Moluccas as the spot from which they went forth.* But it would be premature to refer the origin of the Philipine affinities of Polynesian to this locality. Facts to which attention has already been drawn in this paper prove that the philology of Eastern Asianesia is complex. Several distinct affinities with western groups have been indicated. In Viti we find W. Indonesian, in Rotuman and Tarawan Australian and E. Indonesian and in the Micronesian islands N. Indonesian characteristics which are absent in Polynesian. These indicate a succession of movements from the west to the east, and it is possible that the strong Philipine element of Polynesian may have been derived from N. Indonesia through Micronesia, and the E. Indonesian element through distinct migrations from the Moluccas.

W. Indonesian Compared with N. Indonesian.

The phonology of N. Indonesian, as we have seen, is complex. It has affinities with W. Indonesian, with Micronesian and Melanesian, and with E. Indonesian. Those with W. Indonesian are more marked than those with E. Indonesian and they are modern or recent as well as archaic. The latter are so decided as to prove that the strongest element in the phonology of N. Indonesia belongs to that comparatively harsh and consonantal system which appears at one period to have prevailed over W. Indonesia, and which is still impressed in different degrees, on languages in all the W. Indonesian islands. Our remarks on the phonologies of Java and Borneo leave little room for doubt that this system extended continuously over W. and N. Indonesia and Micronesia, and that it has held its ground against the harmonic and vocalic system more tenaciously in Java, Borneo, N. Indonesia and Micronesia than in the Malay Peninsula and Sumatra. Many of the characteristics of the older W. Indonesian phonology are found in N. Indonesian such as the finals *o* (Philipine) *e* (Formosan) and *g*, the initial *ǹg*, and the abrupt meeting of incombinable or inharmonic sounds such as *gh*. Abruptly consonantal and guttural words are more abundant in N. Indonesian than in the harshest W. Indonesian dialects.* The harsher and more consonantal traits are best preserved in Formosan in which we find the N. Indonesian phonology in its rudest form. Notwithstanding its congonantalism N. Indonesian has a tendency to contract its phonetic elements by commuting several which are kept distinct in most W. Indonesian languages. It is probable that the phonologies of N. E. Borneo will be found to melt into the N. Indonesian. Many peculiar forms of Indonesian words are common to Borneon and N. Indonesian dialects, and the names of places on the eastern face of northern Borneo and the adjacent islands are N. Indonesian, the locative postfix –*an* being as common as in Luzon.† Ideologically W. Indonesian is much more crude, and the remarks that have been made respecting the comparative poverty of E. Indonesian and Polynesian in formatives apply to W. Indonesian also. While it is essentially as crude and simple in its ideologic system as N. Indonesian is developed and elaborate, its formatives are still more unequivocally N. Indonesian than those of Polynesian and E. Indonesian. They are phonetically identical, and their uses, although devoid of most of the refined distinctions and of the wonderful expressiveness of the Philipine particles, agree with those of the latter more strikingly than with those of the eastern groups. We have already mentioned the more important of these formatives and remarked the closer approximation of Javanese to N. Indonesian. The Javan *an*– active and transitive, if not a contraction of *man*–, may be the N. Indonesian *na*–, a slight phonetic change like that of the Lietti *am*– for the N. Indonesian *ma*–. *Ka*– and –*an* have only their most generic N. Indonesian applications, –*an* is substantival, passive and frequently locative or instrumental. In Javan it has also some of the privative applications of N. Indonesian as in forming diminutives and in general it denotes a more limited and specific object either agreeing in kind with the root or having some alliance to it. It also pluralises numerals and temporal substantives, hatus*an* hundreds, tahun*an* years, being a restricted application of the collective power of the Phil. –*an*. The other uses of the particle in Phil., all attributable to a native development of the essential idea of privation, abstraction, or generalisation, are not found in W. Indonesian, and this with the fact of all the specific W. Indonesian uses being Philipine proves that they were derived from that language or its prototype. Similar remarks apply to to *ka* in Jav. and Mal. With –*an* it has some of the peculiar Phil. uses. Thus in Javan it forms locatives. Most of the more refined applications of *ka* and *ka—an*, such as the companionative, equalitive, correlative, simulative &c. &c., are wanting in the W. Indonesian languages So servile have they been that they have not imbibed any sense of the more essential powers of these particles or originated any new applications of them.

---

* See the remarks on this subject, *ante* Vol. V. p. 235.

---

* E. g. *taligboksok*, *tagduc*, *tagkus*, *soktak*, salogsog, *saligbat* kalapkap lagoklok, hokhok, ngitngit

† Balambang*an*, Gulu*an*, Kabankam*an*, Lato*an*, Bankow*an*, Marut*ang*, Maratabu*an*, Pait*an*, Kalang*an*, Lion*an*, Kaidang*an*, Sandak*an*, Kini-batang*an*, &c. The postfix is found in the geographical nomenclature of all parts of Indonesia, but it is nowhere so common as in N. Indonesia and Borneo.

The Javan qualitive *ma–* corresponds with the N. Indon. and the Malay *ber–* is the same particle disguised by the final *r* a terminal which Malayan phonology affects. In dialects of Malay it occurs in the forms *mer, me, ma, ba*. The W. Ind. *pa* has also the N. Indon. power but with less varied applications. In Jav. *pa* is active personative with *–an* locative and instrumental. In Mal. *pe, pen* &c. is also active personative and instrumental. *Men* transitive as in N. Ind. becomes personative by changing *m* into *p*. In Jav. the participial and passive infixes *um* and *in* are N. Ind. So is the Jav. and Malay transitive postf. *–i*.

The Jav. def. *–he, e* is Pol. but the Sundan *etta* corresponds closely with the Ilokon *idi*. The directive and possessive *hing* is Phil. in which it is seen to be a native compound of the def. and possessive particles, the latter not existing in Jav. The same particle occurs as a relative in the pure Phil. form *sing*, and another relative *kang* is also Phil. The time flexions of N. Indonesian and Polynesian are not found in W. Indonesian.

On the whole it appears that the W. Indonesian languages want most of the marks of developement and refinement which the other and more eastern Malayu-Polynesian languages exhibit. If they have acquired more of the N. Indonesian particles than the E. Indonesian tongues, their formative systems have a similar fragmentary and simple character compared with N. Indonesian, and they possess no undoubtedly native traits of an advanced ideology as the E Indonesian does. Their chief peculiarity consists in this absence of higher traits and if we deprive them of their N. Indonesian formatives they present an entirely crude ideologic basis, with some traits which must be considered as peculiar when compared with N. Indonesian, such as the large use of generic or segregative particles and of the post positional demonstrative, the position of the pronoun or other agent before the verb &c. The transitive directive *kan* of N. Indonesian, which is also an element in causative prefixes in that group and in Polynesian, has become a transitive and causative postfix in many W. Indonesian languages.

Our concluding remarks on the position of N. Indonesian will be found in a subsequent section.

NOTICES OF PINANG.*

THE few following papers are taken from the Records up to the end of the year 1805, and relate to those subjects only that seem to possess an interest at the present day. Should these papers be continued, the plan will be adopted of giving under each year extracts from such documents as are likely to be appreciated by those who feel an interest in the sayings and doings of their predecessors on this little island. Each paper will be headed by the subject to which it relates and beyond this the compiler's labours will not hereafter extend.

Report on the progress of the Water-works.

To Captain John Elliott,
Agent for conducting the Water-works.

Sir,—I am directed to request you will furnish me with the following particulars, for the information of the Hon'ble the Governor in Council, viz.:

1st. The terms of agreement, if there are any, under which you are now conducting the new Water-works.

2nd. A report of the progress made since the same were commenced.

3rd. The probable time of the whole being completed, and what is necessary to be further provided for the completion of the work.

I am, Sir,
Your most obedient humble servant,
H. S. Pearson,
Secy. to Government.

Fort Cornwallis, 9th October, 1805.

To the Hon'ble the Governor and Council, &c. &c. &c.

Gentlemen,—I have the honor to acknowledge the receipt of your letter of the 9th instant, requesting me to inform you of the terms of my engagement in carrying on the Hon'ble Company's Water-works, and to inform you of the progress of the works and the probable time it may take to finish them, also what supplies are necessary to their completion.

To the first question, I can only answer I have no terms of agreement, and consider myself entitled to no reward should the work not answer.

To the second question, the works are nearly completed down to within a few fathoms of the wharf, and will be totally so by the end of the present month, a distance of nearly six miles through the windings necessary to be taken for preserving the level.

The grand reservoir has only its foundation laid, and will, I think, require about twenty lacs of bricks with thirty coyans of chunam, the covering in of the aqueduct will also require about ten lacs of bricks and fifteen coyans of chunam. I want no hired bricklayers after the 20th, having taught the Hon'ble Company's convicts to lay bricks equally to the Chuliah bricklayers.

---

* Continued from p. 32.

The tin pipes at the Custom House will, I think, be sufficient to bring the water to the wharf, and there is (I am told) near six hundred yards of smaller pipes to carry the water into the fort, therefore no further expence is wanting but the above-mentioned bricks and chunam, with the carts to convey the same when necessary.

I have the honor to be,
Gentlemen,
Your most obedient humble servant,
John Elliott.

Prince of Wales Island, 11th October, 1805.

State and Management of the Poor Fund.

To H. S. Pearson, Esquire,
Secretary to Government.

Sir,—I am sorry my reply to your letter of the 4th instant, was not sufficiently explicit, more particularly as I have no regulations respecting the poor fund, from which I could transmit you a copy; nor have I any list of the Mahomedan poor, the management of them being left entirely with the elders of the different castes. The Lieutenant-Governor ordered me as third civil assistant to draw for the monthly allowance, and pay the elders their bills when approved of. I now inclose account current of the poor fund with me, made up to the 20th September, for the information of the Hon'ble the Governor in Council, which I hope will be satisfactory.

I am, Sir,
Your most obedient servant,
Thomas Hutton.

Pinang, 10th October, 1805.

Dr. The Poor Fund in Account Current with T. Hutton, T. C. A. Cr.

1805				1805			
July,	To Cash paid Mahomedan Elders for May Sp. Drs.	30	..	July,	By cash received Honourable Company's Allowance, for June Sp. Dollars..	100	..
	„ Cash paid do. for June..	24	50	Aug.	By ditto for July.. ..	100	..
Sept.	„ Cash paid do. for July..	31	..	Sept.	By ditto for August..	100	..
	„ Cash paid do. for Aug..	30	50				
	„ Cash paid Malay Elder, per Bill..	34	25				
	Sp. Dollars	150	25				
To Balance in favor of the Poor Fund..		149	75				
	Spanish Dollars	300	..		Spanish Dollars.	300	..

Pinang, 20th September, 1805. E. E.

Thomas Hutton.

To H. S. Pearson, Esquire.
Secretary to Government.

Sir,

In compliance with your letter I sent for the elders of the different castes, and now have the honor to enclose you their report concerning their poor, for the information of the Hon'ble the Governor and Council.

I remain, Sir,
Your most obedient Servant,
Thomas Hutton.

Pinang, 14th October, 1805.

The Chuliah and Hindoo Elders relieve such of their own castes who are lame, blind, or so diseased as to be unable to work. They give them per month a dollar or a dollar and a half as their necessities require. They bury such of the above description, when they die, or any who die paupers.

The Malay Elders, have done the same; latterly they have not had any poor to relieve.

T. Hutton.

October, 14th 1805

Ordered that Mr Hutton be directed to pay the balance he has in hand into the Treasury, and that he desire the Elders of the castes to send in their bill to the pay-master at the end of every month countersigned by him.

Timber Duty Farm.

To the Hon'ble Phillip Dundas,
Governor in Council, Fort Cornwallis.

The Humble Petition of Shewas.

Sheweth,

Your Petitioner takes the liberty to acquaint your Honor that he holds the Timber Duty Farm, and at the same time encloses your honor the regulations respecting it, issued by the late Collector Walter Farquhar, Esquire. Your honor will please to observe therein it expressly says "nibong, fire-wood and timber of every description liable to a duty of ten per cent on the importation". Your Petitioner particularly inquired of the Collector whether or not the sandal or any valuable wood were liable to pay the Import Duty, and at the same time I shewed him a tree of the former that he should understand me better, he made for answer, that wood of every description was liable to the duty aforementioned. Having been given to understand by the present Collector W. E. Phillips, Esquire, that your Honor have been pleased to direct him to inform me, that sandal-wood is only liable to the Exportation Duty and not the Import, as it will greatly injure me with a considerable loss; may therefore entreat your honor to do me the favour to take the business into your consideration, otherwise the loss will be unsufferable and that it will be out of my power to hold it, contrary with the alteration your Honor have been pleased to make. I further beg to acquaint your honor that all importation of either sandal or any other valuable wood has paid the regular duty of ten per cent, excepting Captain Barker which was directed against me, from which kind act your Petitioner in duty bound

Ever pray.

Resolved—that he be informed that the Board cannot reconsider his Petition, as the decision of the Collector thereon has been already confirmed by government. And that he be also informed that the Board cannot allow their time to be intruded upon on such frivolous pretences, and that on any similar appeal from the decision of the Collector, when government concur in opinion with him, they will subject him to a heavy fine.

Extract from first Dispatch of the new Government to the Court of Directors, under date 12*th November*, 1805.

2. We have the honor to announce to your Honorable Court our arrival in this harbour on the 18th September, and our having landed the following day, when we produced our commissions to the then principal authority Robert Farquhar, Esquire, Lieut-Governor, under the orders of the Government General, who expressed himself satisfied with our powers and ordered the garrison to assemble the next morning for the purpose of hearing the same publicly read.

Our commissions having been read on the parade before the garrison, and the principal inhabitants, a council was summoned when we took the prescribed oaths and our seats accordingly.

* * *

49. The revenue arising from farming the duties on opium, gaming-houses and arrack, have been progressively increasing and are now let at per annum as follows:—

Opium	25,500
Gaming-houses	25,800
Arrack	21,240

The two first of these, as observed by your Hon'ble Court, are in some degree objectionable, appearing to give encouragement to two vices in society, but we apprehend that an application of this theory to the present state of society at this presidency can only tend to decrease your revenues without much improving the morals of the inhabitants.

50. If the inhabitants were permanent residents on the island, they might in course of time, and from the effect of good example, be weaned from such practices, but the class of men who are principally addicted to these vices being only temporary residents, who are regularly preceded by others with similar propensities,

much consideration is therefore required before so productive a source of revenue be destroyed.

51. The import duty of 2 per cent *ad valorem* of 1805-2 on tin, pepper and betelnut, was found vexatious and harassing to the importers, those articles being brought here by prows and other small vessels.

52. This duty was also found to give the farmer undue advantage over other merchants, in the preference which his right of search and excise always afforded him, by which he became nearly the sole purchaser.

53. For these reasons the import duty was abolished and an export duty substituted in lieu of it as follows:

On Pepper	per picul	2½	Copongs
Tin	do.	4	do.
Betelnut	do.	1	do.
Stick (black)	do.	5	do.
Cutch	do.	2½	do.
Rattans	per 100 bundles	7	do.

A Copong being one-tenth of a dollar.

54. The above are the existing duties on these articles, at present farmed at Spanish dollars 19,800 until the 30th of April 1806.

55. Besides the above there is a general export duty *ad valorem* of 2½ per cent on all other articles, excepting gold dust, bullion, opium, gram and spices, and including all such as are transhipped in the harbour, now farmed for dollars 15,720 until the 30th April 1806, which last was imposed by the late Lieutenant-Governor in consequence of orders from the Government General with the view of defraying the expences of the docks intended to have been established.

56. The question whether any further duties can be safely imposed requires much consideration and greater experience than we yet possess, to decide upon. In general we are inclined to give a preference to the present export duty over any that can be established on imports. (A duty we think might be levied on imports) from Europe on the H. C. ships which have not paid Company's duties before at any other presidency, andon imports by foreign ships from Europe, which in our opinion ought to be charged with a higher duty than that paid by those on the Company ships; another duty also we conceive may be established on imports from China.

57. In this paragraph of your Hon'ble Court's instructions we observe that you state it to be by no means your intention that that the Customs should be farmed. On the contrary they must *cantinue* to be managed through a regular Custom House by the Company's officers. We have however to state for your information on the very important subject, that all your duties have hitherto been collected by a farmer, and that by this mode of

collection they have been brought to this present productive amount, which must be diminished in a great degree by the necessary expence of establishment in collecting it, if it is hereafter to be carried through your officers.

58. As the present farm does not expire before the 30th April 1806, we shall have time to weigh maturely the policy of literally obeying your present instructions on this point. We shall at any rate be careful of making any innovation of the sort without your positive orders, or the fullest consideration that much inconvenience and vexation to individuals is occasioned by the mode at present established, to which objection it is certainly liable

59. As soon as we are enabled we shall furnish your Hon'ble Court with further information on the subject of the revenues. In the mean time we transmit a statement of the present heads under which they are collected, calling to your notice that the duties on oil and ghee, and on timber imported, now farmed at Spanish dollars 13,440, having been imposed at the recommendation of the inhabitants, convened by the late Lieutenant-Governor for the purpose of proposing a plan for a police establishment and devising means towards defraying a part of the expence, we are of opinion that the amount thereof though collected by the Company should be considered as applicable to the purpose for which they were imposed.

Grants of Land, State of Cultivation &c.

61. On first taking possession of the island those that cleared the most land in an impervious jungle, were deemed the most meritorious. It is not therefore surprising that grants of land were, under such circumstances, bestowed in a manner that would now be thought inconsiderate.

62. A regular survey of the eastern side of the island was taken in the year 1801 by Mr Philip Mannington and laid before the then Lieutenant-Governor, Sir Geo. Leith, Bart., on the 14th October 1820, accompanied by a paper entitled "A report on the present state of the population and cultivation of the island."

63. We are in possession of a copy of the map, but the paper alluded to is not to be found. Mr Mannington is of opinion that Sir George Leith may have inadvertantly carried it with him and from whom it may probably be forthcoming.

64. We applied to Mr Mannington, to take another survey to amend his former map and statement agreeable to the present circumstances of the island. We find that he has now other pursuits to attend to, and that he has not any memorial from which he could make out another copy of the statement abovementioned, we have in consequence written to the Governor-General' requesting that a competent land surveyor may accompany the officer of Engineers intended for this establishment. On his arrival we shall employ him in making a survey of the at

present cultivated part of the island, which we shall transmit to your Hon'ble Court, as without having such a document in your possession, our references we fear will be hardly intelligible, when we have occasion to address you on the subject of the Naval Arsenal and fortifications.

65. In the mean time we have the honor in transmit by this packet a copy survey of the harbour, made by Mr Douglas, late Superintendant of Pilotage and Harbour Master, which although apparently correct, our little experience will not enable us to speak of with any certainty; at all events it will serve to shew your Hon'ble Court where the docks may possibly be erected.

66. For the present we have put a stop to all further grants of land. Those already granted to individuals appear to be considered as freeholds by their present possessors. The grants do not contain any clause, entitling the Company to resume such as remain waste or uncultivated.

67. Many Europeans have gradually acquired considerable landed estates on the island. A particular statement of the lands so held shall be transmitted to your Hon'ble Court, as soon as the same can be done with any tolerable degree of accuracy, but we can hardly suppose that any European will hold land under a title that will not be considered valid by the general usage of the island, being the only tenure on which property is now held.

68. The common rate of interest on the island is 12 per cent per annum, we shall exert our utmost endeavours to prevent and discourage all usurious contracts agreeable to your orders.

69. We have already stated that lands now in possession are considered as freehold, but we shall strictly attend to your orders in this para: in respect to any future grants that may be made.

70. The pepper plantations seem to thrive very well. The particular extent of this cultivation will form a part of the statement promised in the 67 Para: of this letter. The clove and nutmeg plants promise well—several of the latter are now in bearing and we regret that the whole of your trees of this description, in consequence of orders from the Governor-General, were disposed of on the 20th June last, for the sum of Spanish dollars 9,656.

72. It appears that there was a mistake in the first management of these plants, by their having been planted in cleared and cultivated grounds, whereas they thrive best in thick wood of long timber, whose shelter and shade is necessary for their coming to perfection. Once placed in such a situation they require no further care and attendance, than what is necessary to defend them from being thrown down by cattle or otherwise, till they are of a sufficient size to be out of the reach of such accident; the number of plants sold at the time above stated is as follows:—

Clove plants..............................	1,625
Nutmeg plants............................	5,103
Seedlings..................................	1,050

which promise in due time amply to repay the purchaser.

73. It is estimated that there are from 12 to 1,400 slaves on the island, most of whom are employed in domestic purposes. A register is kept of their sale and transfer from one to another, but there is not any tax or duty levied upon their importation; it would perhaps be good policy to impose a duty, as no inconvenience could arise were it entirely discontinued.

Coinage.

74. The only coins at present in circulation are the Spanish dollar and a pice of tin, 100 of which are equal to a dollar. On the best enquiry, it appears that a silver coin of 50 pice.
ditto of.............................. 20 „
ditto of.............................. 12½ „
which ought to be 10 per cent more alloy than the dollar, would be highly convenient for the interval use of the island. The introduction of the alloy is recommended to meet the expence of the coinage and to obviate the exportation of the coin as bullion.

75. We earnestly recommend to your Hon'ble Court that a sum to the amount of £15,000 be sent out in such coin for this island, which we are convinced would much benefit the inhabitants in reducing the price of the smaller articles of consumption without loss to the Hon'ble Company.

76. In addition to the above, a small copper coin may easily be made on the island sufficient for the general use, to which it can be applied, without the Hon'ble Company being at any expence thereby.

Naval Arsenal.

77. We have not much to observe on this most important point of your Hon'ble Court's Instructions, in addition to what we have stated in the 6th paragraph of this despatch. Of the practicability of making docks in this harbour, there is not any doubt. The building of large ships must depend on the facility with which we shall be enabled to produce materials, a point that has not as yet been ascertained.

The island of Jerajah holds forth in addition to other reasons, that of its being still the Hon'ble Company's property as the fittest place for commencing the establishment, there are also places on the shore of this island, on which docks might be constructed, but where the property of the land must first be purchased, the whole shore from the Fort to the river Cluan, being in the possession of individuals. This however, if any highly favourable situation is found, will be but a secondary consideration in establishing a great Naval Arsenal.

79. We wait with anxiety the arrival of the Civil Engineer from England, to be enabled to report more particularly to your Hon'ble Court on this subject. We hope to find that a fortunate selection has been made of the person, on whose judgement and

talents the success of this measure so materially depends. In the meantime our exertions shall not be wanting in forwarding this important object, possessing as we feel we do, the advantage of very eminent professional assistance in the advice offered to us by Sir Thomas Troubridge, Bart., Commander-in-Chief of H. M. ships on this station, and we are happy to embrace this opportunity of assuring your Hon'ble Court, that while he remains here there is every reason to look for a most cordial and zealous co-operation towards general good between H. M. and the Hon'ble Company's officers.

Fortifications.

80. We must defer replying to this paragraph until the arrival of the Engineer for whom we have made application to the Governor-General, there not being an officer of that description at present on the island. We must however remark, that the present fort which was almost in ruins and without a gun mounted, has been in some degree restored and improved by the erection of some out-works towards the sea by the late Lieutenant-Governor, so as to offer a more formidable fire than its former state to ships approaching, but it is too much exposed to be tenable against the artillery of large ships when once abreast of it, as they can anchor nearly within a few yards of the works, and if they were to pass it, which they might with a fresh breeze, they would set fire to the town, without any interference from the fort. To remedy this defect the late Lieutenant-Governor projected the erection of a battery of heavy guns, at the extremity of a pier, run out to the southward of the fort. The pier was built and the caisson placed, on which the battery was to have been erected, but in consequence of its having overset from the want of a skilful Engineer to direct the work, the undertaking for the present is at a stand.

Military.

81. We have the honor to enclose a return of the present garrison, a part of which is to be relieved by a portion of the troops daily expected from Balambangan, agreeable to the order of the Governor-General.

82. We beg leave to call your Hon'ble Court's attention to the very inefficient state of our garrison in point of European troops and officers, and to express our opinion, that the place being so open to sudden attack cannot be considered as safe without a respectable force of European artillery men, with a greater proportion than usual of officers attached thereto.

83. In noticing the want of European officers, we have to observe, that in all probability this will always be the case, while the price of the necessaries of life are so much higher than in every other part of your possessions, as to render their being stationed here a great hardship. To remedy this inconvenience

we recommend to your Hon'ble Court to authorize us to grant them while serving here a similar additional allowance to that which has been received by your troops at Bencoolen.

84. We also recommend that the native troops here, golandauze as well as sepoys, should be with their officers regularly relieved from Bengal or Madras, a measure which we conceive absolutely necessary for preserving that good order and discipline so essential to the constitution of a respectable military force.

Administration of Justice.

87. We look with impatience for the arrival of His Majesty's Charter for the administration of justice at this presidency. The charter is so indispensably necessary, that without it we venture to predict that the prosperity of this settlement cannot be permanent. It will be deserted by all orderly and will become an asylum for the flagitious and the enemies of government and law.

88. If unfortunately the granting of this charter should by any circumstance be delayed, we shall deem it our duty to exert the authority vested in us for restraining the turbulent and punishing the disobedient of the European part of our inhabitants, in any case where the exertion of primary authority may appear to us requisite.

89. The only power we found on the island bearing the appearance of a regular administration of justice, was lodged in the office of the Judge and Magistrate, who in conformity to certain regulations established under the authority of the Government General, by whom he was appointed, decides or rather gives his opinion on all suits where the parties, or at least the defendants, are not Europeans – this opinion became a sentence on being confirmed by the Lieutenant-Governor, who also had the power of reversing and altering the same if he thought proper.

90. Petty thefts, assaults, and in general all crimes, not amounting to felony, are tried in the same manner and the convicted punished under the sentence.

91. To prevent the total cessation of every thing in the form of an administration of justice, we have for the present authorized the Judge and Magistrate, Mr Dickens, to continue in office with the same allowance he has heretofore received, amounting to rupees 2,000 per mensem, under the regulations and instructions he has heretofore acted upon, submitting his opinion to us for our confirmation or otherwise.

92. In all cases of accusation amounting to felony, the accused are tried under the above regulations, by a Court consisting of the governor, the Judge and Magistrate and a third person summoned by them, who report their opinion to the Government General. The accused, if found guilty, are committed to close confinement. We can only be induced to bring cases of this nature to trial in the hope that the party accused may be found innocent and conse-

quently liberated, as it appears that the Government General in no one instance since the institution of this Court, if such it can be called, have passed an order for execution on the sentences referred to them, or even taken any notice thereof, from which circumstance there now remains in gaol 21 convicted murderers likely never to be punished.

96. The above relates only to such cases where natives are the parties, whilst the more turbulent European remains on the island free from all restraint, with the power of committing every act of injustice and irregularity towards his neighbour and the most peaceable native, having set at defiance all authority as not legally established on the island.

97. When we are enabled to decide which will be the best situation for the docks and seat of government, we shall immediately select a proper spot of ground for the erection of a Church. Divine Service has hitherto and will continue to be performed at the Government House, until an eligible building shall have been erected. We hope and trust that by Mr Lake's endeavours and our good example the interests of religion and morality will be promoted at this presidency.

ESSAY ON SEMI-HORIZON LIGHTS.

By J. T. Thomson, Esq. F. R. G. S.

In the system of Coast Illumination, for the guidance of the mariner, a subject of the greatest importance to all maritime nations, and which has received the aid and earnest attention of the most scientific in improving and perfecting it—two modes have been adopted for directing the rays of the flames of the lamps towards the observer; viz., reflection from mirrors, and refraction through lenses. These two modes of economizing the light have been used singly or in combination, and have also been subjected for the particular office they have had to perform to many modifications.

So late as the middle and latter part of the last century, Light-house illumination had received so little attention that common coal fires were used for this purpose, and for forty years after Smeaton had finished his magnificent work, the Eddystone Light-house, that structure was lighted by the dim and unassisted flames of tallow candles, whose rays escaping in all directions by natural divergence, but a small proportion of light was thrown out towards the eye of the watchful and anxious mariner.

It is not the intention of this short essay to attempt a history of the rapid improvement that Light-house Illumination has received through the labours of various men of science in Europe,* but to endeavour to elucidate what has been done in the particular branch to which I propose confining my remarks; viz., to lights which being placed on the Coasts of Continents or large islands only require to illuminate towards the sea horizon, and consequently not to landward; the arc of illumination thus being half a circle, or 180°, or a little more or less, as the configuration of the coast on which the Pharos is situated is convex or concave towards the sea, and which may be appropriately termed "semi-horizon lights," as they bring within their influence only half the circumference of the horizon.

In looking at the Map of the British Indian Dominions, it cannot but strike the enquirer how even and tame their coast lines are for the most part, unmarked by any jutting promontories or deep bays, and how few islands or rocks there are where lights illuminating the whole circumference of the horizon would be required, and therefore how applicable the system of semi-horizon lights is to such a peculiar physical state of their shores, where, for the guidance of shipping, the seaward half of the circle only requires to be illuminated.

* Should this interest the reader he is referred to the account of the Skerryvore Light-house by Stevenson, where the subject is fully treated, or to a small work by the same author, published in Weale's Rudimentary Series.

Where there are many lights upon a coast, it becomes necessary to have their appearance marked one from the other, so that when descried by the approaching mariner they may be easily distinguished. Catoptric or Reflecting Lights are susceptible of nine separate distinctions, which are called fixed, revolving white, revolving red and white, revolving red and two whites, revolving white and two reds, flashing, intermittent, double fixed lights, and double revolving white lights. Dioptric or refracting lights on the system of Fresnel, the original inventor, depend more upon their magnitude, and the measured intervals of the time of their revolution, than upon their appearance, and no other very marked distinctions except fixed and revolving have been successfully attempted in France, where this mode of illumination was first introduced, though colored media have been latterly applied successfully in other countries and fixed lights varied by flashes have also been proposed and probably already introduced.

In the illumination of a coast line, where no more than the semicircumference of the horizon requires to be brought under the influence of the light, it had been to within a late period, the practice in the case of fixed lights, to use common paraboloidal reflectors pointing seaward only, by which means no loss of light was sustained excepting through the imperfections of these instruments, but in the case of revolving lights, the reflectors were allowed to to revolve round the whole circumference of the horizon, which necessarily caused half the light to be expended uselessly, as the reflectors traversed through a semi-revolution on the landward side, where the light was not required, thus causing a large expenditure of oil, wicks, glasses, &c. To obviate the useless expenditure, caused by the imperfections in the apparatus of both classes of lights, while in a great measure not interfering with the possibility of having the various distinctions above mentioned also applicable, has been the object of several inventions, which it is proposed in this paper to describe. I shall first commence with semi-horizon fixed lights, but before proceeding, it will be as well to make a few remarks regarding the common method of Lighthouse illumination by Catoptric Fixed Lights, in which 13 reflectors would be required for 180° of the horizon; these would be either ranged side by side on a circular frame or in tiers, so that each reflector would illuminate a portion equal to 13° 51' of the semi-horizon. In a mirror whose focal distance is 4 inches, and its greatest double ordinate 21 inches, illuminated by a flame 1 inch in diameter, we find by computation that the greatest divergence is 14° 22' and that the strongest arc of light is only 5° 16', a difference so great, that while the one may admit of the horizon being imperfectly illuminated by means of 26 reflectors, the superior light which would result from confining the duty of each instrument within the range of its best effect, could only be obtained by the use of 68 reflectors, and the expenditure of a proportionately great quantity of oil, not to speak of the great practical difficulty that would attend the arrangement of so many lamps in a lantern of moderate size.* Thus the horizon is illuminated by cones of rays emanating from the reflectors, each cone being directed to a separate arc of the horizon, which it illuminates strongly in the centre of the cone, but imperfectly at the edges. This method of illumination has therefore a great defect in not being equally bright in every azimuth, but directing strong rays of light to one part and faint to another; another defect accompanying the system, is in the large quantity of light lost by the great divergence of the cone of light above and below the horizon, induced by the general practice of having the flame of the lamps at a short focal distance, by which greater divergence of the emanating rays spreading over greater arcs is obtained, which allows of a decrease of the number of reflectors necessary for the illumination of the horizon.

The maximum luminous effect of the reflectors ordinarily employed in fixed lights, as determined by observation, is generally equal to about 350 times the effect of the unassisted flame which is placed in the focus, while, for those employed in revolving lights, which are of larger size, it is valued at 450. This estimate is however strictly applicable only at the distances at which the observations have been made, as the proportional value of the reflected beam must necessarily vary with the distance of the observer, agreeably to some law dependent upon the unequal distribution of the light in the luminous cone which proceeds from it. The effect also varies very much in particular instruments.†

In comparing the instruments about to be described with those ordinarily employed, and also with one another, in absence of practical test perhaps the most simple and satisfactory mode will be to value the whole rays of the flame that would escape by natural divergence to every point of a surrounding sphere at 100, it being only necessary to consider in this paper the effects of Argand burners of the common size, viz., one inch in diameter, but the principle of comparison is equally applicable to the mechanical lamps used in Fresnel's Dioptric Lights, which burn a large and brilliant flame, provided that in instituting the comparison between the different instruments, flames of equal intensity are supposed to be applied to each. The quantity of rays that escape unreflected or unrefracted, when the flame is placed in the focus of an instrument, being deducted from the total proceeding from the flame, and also those that are made of useful effect, by being subjected to the influence of the instrument, having their loss of power in the process estimated, the relative efficiency of the system may be tolerably well approximated to. Mr Alan Stevenson estimates that the large mirrors used in the Northern Lights have about $\frac{11}{16}$ths of the whole light of the lamp incident on their surfaces, the rest escapes in the comparatively useless state of naturally radiating light.

---

* Stevenson's Skerryvore Light-house, p. 216.

† Ibid. p. 217.

It has been shown by the most accurate experiments which have been undertaken by scientific observers, that reflection from the best silvered mirrors, and even from metallic specula, made with the utmost care for experimental purposes, involves a loss of light by absorption, of not less than about one-half of the whole incident light.* The loss by transmission through an average specimen of crown glass, of about 1½ inches in thickness, is somewhat less than $\frac{3}{8}$ths of the incident light,† and according to the experiments of Bougier the loss by two refractions may be assumed at only $\frac{1}{20}$th, but in small lenticular instruments, the glass being much less in thickness than that above stated, the total loss may be fairly assumed at only $\frac{1}{10}$th of the incident light which is the estimate given by Mr Alan Stevenson.‡ With these data before us, we will be enabled to estimate the relative qualities of the different instruments about to be described; thus, taking the common paraboloidal reflector as an example, let the total sphere of rays equal 100—$\frac{11}{16}$ths or nearly 70 parts are acted upon by the apparatus, which in the process of reflection lose half their power, leaving the useful effect equal to 35 or ⅓rd nearly.

The apparatus for Fixed Semi-horizon Lights first demanding attention, is that of Captain J. T. Smith of the Madras Engineers, for his new system of Fixed Lights has been extensively carried into practice throughout India. A full description of his useful invention will be found in the Papers of the Corps of Royal Engineers, Vol. 5, p. 56, and from which I propose making sufficient extracts to explain the nature of it.—The invention may shortly be described as being composed of one-half of a hollow parabolic spindle, generated by the rotation of a parabola about its parameter, as a vertical axis, and into the focus of which a flat wick is placed, but the peculiarities and properties of the invention I leave its author to describe. The inventor states, "Those (instruments) which I have to describe, have been "constructed at charges varying according to power from 100 to "1,000 Rupees, and may be contained within limits ranging from "a diameter of 6 feet, down to the size of a cylinder of 1½ feet in "diameter, and 2½ feet high." After describing the dioptric arrangement of M. Fresnel, he continues, "In attempting to "imitate this (Fresnel's Dioptric arrangement) in Catoptrics, it "will be manifest from what before has been explained, that for "the wall of prisms we must substitute the parabolic section;

---

* Brewster's Optics.

† Stevenson's Skerryvore Light-house, p. 268.

‡ Weale's Rudimentary Series, Part 2nd, p. 139.

" and it is necessary to remark also that it is essential that the " axis of rotation of the cylinder to be formed, should pass through " the focus of the section, that is through the focus of the " parabola. The axis of rotation therefore becomes the parameter " of the curve, or the focal ordinate, and were the dimensions " similar to those adopted in all Fresnel's dioptric zones whose " focal distance is three feet, and the refraction confined to the " lower part of the sphere of rays emanating from the light, by " cutting off the solid formed by the revolution, that portion " which approaches the axis and occupies a vertical situation in " respect to the light, a bulged cylinder would also be generated, " (Fig. I,) which would much resemble a wine cask. But in the " small reflectors that I am now speaking of the whole of the " curve intercepted by the parameter is used, instead of merely " the zone whose section is *a b*; and the figure produced by its " rotation, is that shown by the dotted lines, the shape of the " instrument itself being very like an empty canoe or the half of a " nine pin."

Again " The reflectors which have been hitherto used by me " have been principally of the dimensions of 2 feet in height by 1 " foot in breadth, and 3 feet by 1½ foot, that is of 6 inches and 9 " inches focal distance. When the size of the lantern of a light-" house will admit of it, it would be more effective as well as " economical to use larger dimensions. The lamps which are " fitted to the reflectors are necessarily of a peculiar kind, for on " considering the properties of the double curve used for reflection, " which it will be recollected is a parabola vertically, and a semi-" circle in its horizontal section, it will be observed that all the " reflected rays must pass through the axis of rotation, that is, " through the parameter of the curve, the middle part of which " is the focus and contains the lamp, which were its construction " such as is commonly adopted, would very probably fill up a " large portion of its height by its own body, drip cup " and chimney; and thus since the whole of the rays are obliged " to converge and pass through this axis, they would nearly " all meet with obstruction, and the entire efficiency of the " instrument be destroyed, it is therefore indispensible that the " burner, and all the solid parts of the lamp inside the reflector, " should occupy as little bulk as possible; and although the use " of a chimney would be less open to the same objection, yet since " in spite of its transparancy, it could not fail to be some interrup-" tion to the free passage of the rays, and might very probably " interfere with their correct diffusion, it would be highly desir-" able that it should be dispensed with. This desideratum is still " further enhanced by the great difficulty and constant trouble " which would accompany the attempt to keep up a constant " supply of such fragile articles, the delay and uncertainty in " procuring which, and the great inconvenience which would be

" met with in providing for the wants of numerous outstations, " would impose an unceasing and vexatious trouble upon the " Marine department."

The nature of the lamp is then described by the author, the fountain of which is placed behind the apparatus, from whence a horizontal pipe leads the oil to the burner, which is constructed to hold a flat wick, placed in the focus, as shown in Figs. 2 and 3. The breadth of the flame is 3 inches, and height 1¼ inch, which the author informs us he has found equal to the power of argand lamps used in British Light-houses, to which he adds, that " in speaking of the comparative illuminating powers of the " argand, and the above flat wick lamp, as being equal, I ought " not to omit the distinction which exists between their intensities. " The argand lamp such as is used by the Trinity Corporation, has " a flame of 1 inch diameter, and 1¾ in height, that is, showing a " surface of 1¾ square inches in any horizontal direction. The " flat burner lamp exhibits a flame of 3 inches by 1¼ in height or " 3¾ square inches, but it must be observed that in the former " every part of its surface exhibits the light of a double sheet of " flame, which being shaped like a hollow cylinder is doubled in " every aspect; every square inch of the visible flame of an " argand lamp is therefore equal in illuminating power to two " of the simple flat burner I have just described, or in other " words, its intensity is twofold greater; in addition to which " there is a superiority in the combustion, when aided by the " current of air by the chimney, which further assists in making " up for the difference of the surface."

Again, " a single reflector of the kind I have described, when " used in the back of a small lantern suffices to answer the pur- " pose of a beacon, which is seen equally in all directions through " half the horizon to the distance of 15 or 20 miles in this " climate, according to elevation. The visible appearance to a " spectator, in any direction, is that of a bar of light, similar in " shape to the front face of the reflector, only narrower, its " breadth being somewhat more than the breadth of the flame, " as seen from the same point, and its light the whole height of " the reflector. When two or three are combined, they ought to " be ranged parallel to one another, if intended for a light-house " on the coast, and circularly if meant to give a light to an entire " circumference of the horizon, as when placed on an Island. " When the reflector is of the size of 2 feet in height by 1 foot in " breadth, its power as obtained by experiment is equivalent to " the multiplication of the effect of the lamp in its focus by " 10 or 12; when of 3 feet by 1½, it is as I calculated increased " to 15 or 16, that is a lamp, to which either of these reflectors is " applied, is equal in illuminating power to 10 or 15 similar " lamps unaided by reflection. Theoretically the superfecies of " the illuminated part of the reflector, may be calculated to

" be ⅔rds of the area, expressed by the breadth of the flame, " multiplied by the height of the reflector, which would with " the small reflector give ⅔rds of 3 × 24 or 48 square inches as " compared with the area of the flame, (or 3¾ inches) and a " comparison of these relative superfecies gives 12.8 as the ratio " of augmentation*, but this leaving no allowance for the practical " loss of light in reflection, is rather confirmatory of the first than " of the second of the experimental results above quoted, and " that as being the lowest, may be safely depended upon."

The author again proceeds, " In order to establish a comparison as to the absolute power of the two systems, (the author's " and the common one) let us compare the effects of 12 of the " Trinity house reflectors, which is the number requisite to fill " half the horizon, with twelve of the periscopic kind, if I may so " term them. The former are circular and 21 inches over the " lips, the latter 18 inches in breadth by 3 feet in height.

" The maximum effect of each of the common reflectors, is " represented by the area of its end or 346 square inches, which " is the area of the circle of the flame, which it will exhibit in " the most favorable position, and this has to be multiplied by " two, making it equal to 692, to account for the relative intensity " of its light, as compared with the periscopic reflector.

" The above is a calculation of the most favorable appearance " of a series of 12 reflectors, in any aspect, because only one can " be seen at once, and the numerical measure above stated, is that " applicable to the most favorable view of it.

" On the other hand a series of twelve 3 feet periscopic reflectors, exhibits in one view 12 bars of light, each of which " measures ⅔rds of 36 × 3 or an area of 72 square inches, " making altogether 864 inches, whose intensity is represented by " unity. The relative illuminating powers, therefore, of the two " systems, are of the common reflectors 692 and of the new ones " 864, but the above is a representation of the maximum effect of " the common parabola, and it has been found that the minimum is " less than one-eighth of this. The average effect is therefore " only 4½ 8ths of the above, or to be expressed by 4½ 8ths × 692 " or 389, whilst the average effect of the periscopic Light is still " represented by 864, the illuminating power being the same in all " directions. With mirrors therefore of 3 feet by 1½ foot, an " improvement is effected in the available power expressed by the " ratio of 864 to 389, besides the independent advantages resulting " from the equality in distribution."

As compared with dioptric lights which have only one large lamp, and their relative chances of being eclipsed through accident, the inventor proceeds, " but in the system which has been " described in this paper, it will be observed, that as the illumina-

---

* The loss of light by reflection being equal to ½, the ratio of augmentation will be 6·4.—J. T. T.

" tion in every part of the horizon is made up by the combined " effects of the whole of the reflectors constituting the series, not " even the smallest part of the horizon can be eclipsed without " the simultaneous failure of the whole of the lamps; an accident " the chances against the occurence of which are not merely " in the simple ratio of the number of lights used, but are " represented by the power of the ratio which expresses the " chance of the failure of a single lamp, whose index is the number " employed.

" Were the probability of the failure of any single lamp there-" fore, even so great as to be represented by the fraction $\frac{1}{100}$, the " chance of an obscuration of the whole system would be no " greater than $\frac{1}{1,000,000,000,000,000,000,00}$, a probability which " might be fairly considered indefinite. The only evil consequence " which could therefore be ever apprehended, would be the " diminution of the effect by an occasional failure, which would " reduce the illuminating power by $\frac{1}{10}$th; the danger of any " portion of the horizon being at any time eclipsed being alto-" gether annihilated."

Regarding this apparatus Mr Alan Stevenson the eminent engineer to the Northern Light-house board makes the following remarks:* " Captain Smith of the Madras Engineers has described " in the professional papers of the "Corps of Royal Engineers," " a new system of fixed lights, which consists in placing a flat " wick in the focus of one half of a hollow parabolic spindle, " generated by the rotation of a parabola about its parameter, as a " vertical axis. The action of the instrument is obvious, for each " vertical section being parabolic, effects a change only in the " vertical divergence of the rays incident on it from the focus, " and suffers their horizontal direction to remain unaltered; " thus each vertical plate of reflected rays, passes through the " parameter of the curve, and illuminates the opposite point of the " horizon by means of a narrow strip or line of light. Two " hollow spindles of that form, each lighting 180° and facing " opposite azimuths, would therefore be sufficient to illuminate " the whole horizon. The author of the paper however appears " to contemplate the employment of a series of these mirrors, " ranged one above another, and breaking joint vertically, some-" what in the manner already described, in speaking of the " arrangement of the paraboloidal mirrors used in fixed " lights. The advantages of this mode of illumination are much " overrated by Captain Smith, who seems to magnify beyond its " real importance the risk attending the use in the dioptric " apparatus of a single lamp, whose sudden extinction would " deprive at once the whole horizon of the benefit of the light; " while on the contrary he reckons the security obtained by his

---

* Account of Skerryvore Light-house, p. 238.

" arrangement, as an advantage of the highest value. In certain " situations where no regular establishment of trained keepers is " maintained, that security may be an object of more importance, " and may warrant a greater sacrifice, than is necessary in Great " Britain, but I have no hesitation in saying, that I know of no " situation in which the plan proposed by Captain Smith, could " bear comparison with the mode of illumination for fixed lights, " by means of the catadioptric instruments of Fresnel."

However correct the remarks of Mr Stevenson may be in regard to the apparatus, as applicable to the Light-houses of Great Britain, it must be with justice accorded to Captain Smith, that great benefits to the shipping interest have been conferred by his labours and by the introduction of his cheap yet scientific apparatus, because in India the illumination of the coast being of less importance, owing to the scarcity of shipping, than on the much frequented, boisterous and rugged coasts of the British Islands, any more expensive attempt at improvement in the Light-house illumination of India, would have been delayed till the increase of commerce in the course of years had justified a greater outlay. So late as the year 1801 the light at Harwick (in England), in addition to the coal fire had a flat plate of rough brass on the landward side, to serve as a reflector,* and in the East until more modern times, (1842) the city of Madras had its light of 12 lamps, aided only by plain reflectors,† and the more obscure town of Malacca, till 1845 was content with a common lamp, backed by 3 looking glasses, which at most could only increase the light to double the unassisted flame. On such primitive contrivances as these, the invention was an immense improvement, and considering the requirements of navigation at the time of its introduction, and to what rude and ignorant hands it had to be entrusted in the outstations, the instrument must be acknowledged to have been eminently adapted to the wants of the time, which entitles the inventor to the highest credit for its successful and extensive introduction.

The instrument perfectly fulfils the required conditions, in illuminating by a sheet of light 180° of the horizon, which is not performed by any other single instrument of the catoptric system, but that its effective power has been overrated by its inventor, I believe with Mr Stevenson to be the case. First testing the instrument by the method proposed by me in a preceding page, by making the whole sphere of rays of the flame equal to 100 and then estimating the quantity that are rendered of useful effect, minus their loss by deterioration in the process, it will be observed that though the nature of Captain Smith's lamp is on a different principle, yet the inventor has constructed it, so as to be equal in power to the argand burner, it will also be noted that the reflector only influences the back rays of the whole sphere, leaving the front rays to escape uselessly by natural divergence; supposing it to be plated with silver in the same manner as those usually held in requisition in the Light-houses of Great Britain, such rays as are rendered of useful effect, will lose half their power by absorption on the face of the instrument. With these facts before us the effective power of apparatus will be equal to $\frac{100 \quad 50}{2}$ or 25.

---

* Stevenson on Light-houses (Weales series) part 1. p. 61.

† Prof. Papers Royal Engineers, vol. 5. p. 75.

To the above result, in rigorous investigations the power of the naked flame ought to be added, the space taken up by the burner and feeding pipe, which obstruct the passage of the rays of the bar of light, also ought to be subtracted, but these small items may be neglected in calculations which can only be attempted approximately. It will therefore be seen that the ratio of the power of the Periscopic light, as compared with the paraboloidal light, is as 25 : 35, by the above mode of calculation.

Now reverting to the inventor's mode of comparison, as detailed in a preceding page, it will have been noted, that he had arrived at the high result which exhibits his periscopic Light as exceeding the Paraboloidal light, hitherto in universal application to the catoptric lights of Great Britain, in the ratio of 864 to 389. Granting that all his data and deductions were correct, up to the result above stated, it will occur to the enquirer that he has neglected a very important characteristic in the plan of his instrument, which when duly considered will be found to confine, the power of the apparatus to a greatly lower standard than its inventor has inadvertently been led to give it. What has been omitted to be considered is the greater focal distance of his reflector, as compared with the paraboloidal one, which renders its illumination more faint than the latter. This fact will be made obvious to the general reader, by familiar illustration; the letters on the page of a book may be discerned at 20 feet distance from a small lamp, but at 40 feet distance the light shed upon the same book is too faint to allow the characters to be any longer visible; so with the paraboidal mirror, whose average distance from the lamp is about 7 inches, the light shed thereon is strong, and with the periscopic mirror whose average distance from the lamp is about 13 inches, the light shed thereon is faint. The distances of the reflectors from the lamps being given, the relative intensities of their illumination will be found by the following proposition viz:

The intensity of light decreases as the observer recedes from the luminous body, in proportion to the square of his distance.

Suppose a beam of light (Fig. 4) to proceed from a radiant at F. and we shall have the rays which of course move in straight lines gradually receding from each other, as b b' b'' b''' and c c' c'' c,''' so that the section of the beam will increase with the distances Fb and Fc, and the same number of rays being thus spread over spaces continually increasing, will illuminate the surfaces with less intensity. This decrease of intensity will therefore be in the inverse ratio of the extent of the transverse parallel sections of the luminous cones, at b and c, which we know increase as the square of their distances, from the apex of the cone at F; hence we conclude that the intensity of any section of a divergent beam of light decreases, as its square of its distance from the radiant.*

Applying the correction furnished by the above proposition, to Captain Smith's result, we will obtain the true effective power of his instrument,

$$\text{equal to } \frac{7 \times 7 \times 864}{13 \times 13} \text{ or } 250$$

thus the periscopic mirror is to the paraboloidal, as 250 : 389 or as 25 is to 39 nearly, by this mode of testing, the result of the former calculation being as 25 : 35.

In proving Smith's periscopic reflector to be so much inferior to the paraboloidal in the actual amount of light given forth, when the flames in each are equal, the economical distribution of the light effected by the former, as compared with the latter, must not escape mention. The periscopic reflector sends out a sheet of light towards the horizon, which it equally distributes over an arc of 180° and no part of the sheet of light is uselessly expended, for the great focal distance of the reflector causes an aberration of the rays, only to an extent of 4° or 5° according to the size of flame, or class of reflector, while the paraboloidal reflector sends out a conical beam of light, which it distributes unequally over an arc of 11° to 14° degrees of the horizon, and it at the same time spreads its beam over the same arc vertically, so that a great part of its light escapes into the heavens, or into the depths of the sea, where they are evidently not wanted. These circumstances bring the two systems more upon a par, as applied to Light-house illumination by Fixed Lights, but probably it could only be satisfactorily judged by actual experiment, as to which possessed the greater merits, and I have not learned if this has ever been done.

The next apparatus that I would propose to describe as adapted to illuminate ½ the horizon is Fresnel's fixed Dioptric light, as it perfectly fulfils the required conditions.

This apparatus is shown at Fig 5; where f is the flame, placed in the centre, and whose rays are intercepted by a cylinder of glass zones, by which their natural direction is modified, by being bent towards the horizon. R is a band or hoop of glass called the cylindric refractor, and p p p p are rings of the same material termed totally reflecting prisms. The cylindric refractor R R is a solid, generated by the rotation of the middle vertical section of an annular lens round a perpendicular axis. This circular band of glass having no refractive action laterally, modifies the rays that strike on it only in the vertical plane, so that in every azimuth a vertical strip of light is given out towards the horizon. The totally reflecting prismatic rings p p p p perform the office of collecting and bending towards the same direction in every azimuth those rays which not being subjected to the action of the annular lens R R would otherwise escape uselessly above and below by natural divergence. These prismatic rings are solids generated by the revolution of triangles of particular forms, round their vertical axis, which passes through the centre of the apparatus. The rays of light proceeding from the lamp in passing through the cylindrical refractor R R, suffer two refractions, one at the points of incidence, and the other at the points of emergence. Such rays as fall on the prismatic rings p p p p, are first refracted at the inner side, from whence they pass to the upper side, where they suffer total reflection, and then emerge after a second refraction at the third or outside of the zone.

---

* Stevenson's Skerryvore Light-house, p. 337.

It will be obvious that half of such an apparatus, divided vertically, having a lamp placed in its focus, will illuminate 180° of the horizon, as the whole apparatus does so all round the circumference. By this apparatus about $\frac{4}{5}$ths of half the sphere of rays of the lamp are subjected to its action, which in passing through suffer a loss of about $\frac{1}{10}$ as estimated by Mr Stevenson. Proceeding upon these data the effective power of the apparatus will be equal to $\frac{9}{10}$ of $\frac{4}{5}$ of $\frac{100}{2}$ or 36 this is assuming the lamp to be the same size and power as those of the preceding, viz: equal to 100. It is scarcely necessary to observe that in this instrument, the front rays are only made available, the back rays escaping uselessly by natural divergence. The economizing of these back rays early attracted the attention of Light-house engineers; Mr Alan Stevenson informs us* that so far back as 1834, he suggested the placing of a segment of a spherical mirror, with its centre of curvature coincident with F (Fig. 6) the focus of the system, so that the luminous pyramid M F M of which the mirror M M forms the base, might be thrown back through the focal point, and finally refracted into such a direction as to contribute to the effect of the lens Q A q in the seaward and opposite arc. In the diagram, r r indicate rays proceeding directly from M M through F, and finally refracted at Q A q and r'' r'' is the beam compounded of both. This addition of so obvious importance has been extensively carried into effect by various Light-house engineers.

The plan of this instrument will be seen in Fig. 7 in which F is the lamp, b b b the refractors,, and a a a the hemispherical mirror, it is scarcely necessary to observe that the back rays c c c proceeding from the lamp are reflected back through the focus to the refractors b b b, where they in the same manner as the front rays, are made of useful effect, by being bent in a sheet of light to every azimuth contained in 180° of the horizon. Making the power of the flame equal to 100, and allowing the refractors and reflector to each act upon $\frac{4}{5}$ths of each hemisphere of rays we will have the following estimate of the effective result :

---

* Stevenson's Lighthouses (Weale's Series) part 2 p. 102.

$$\text{equal to } \tfrac{9}{10} \text{ of } \tfrac{4}{5} \text{ of } \tfrac{100}{2} + \tfrac{1}{2} \text{ of } \tfrac{4}{5} \text{ of } \tfrac{100}{2} \text{ or } 56$$

For the last instrument worthy of notice as applicable to fixed semi-horizon lights, we are indebted to the scientific labours of Mr Thomas Stevenson. It is termed a totally reflecting hemispherical mirror. This apparatus, while it will be found to be the most powerful of those described, will in practice also prove the most durable and efficient, requiring at the same time little trouble or care in management. The Committee appointed by the Royal Scottish Society of Arts, reported of this instrument, that it appeared to them to be so simple and elegant in theory, and so promising as a practical improvement in Light-houses, that they hoped it would be speedily constructed, and the inventor informs us in a pamphlet republished from the transactions of the society, that Mr John Adie, of Edinburgh, had engaged to construct it.

In this pamphlet, the instrument is proposed to be placed at the back of a holophotal apparatus, which would illuminate only a small arc of the horizon, (4° or 5°), but it is equally applicable to the half of Fresnel's lenticular system, illuminating 180° of the horizon, where it would aid that system in the same manner as the hemispherical plated mirror above described, by returning the back rays of the lamp flame through the focus, to the half cylinder of lenses.

The effect of this arrangement will best be understood by examining Fig. 8, which represents the cross section of a single concentric zone. The first or inner surface of each zone being concave, and having its centre in the focus F, will, *theoretically* speaking receive any ray F e as a normal at e, and no refraction taking place the ray will proceed unaltered in its direction from e to r, at this point it will be totally reflected in the direction r r′, whence it will be a second time totally reflected, in the direction r′ e′, at which latter point e′ it is also normal to the *inner* surface, and consequently proceeds unchanged in its path, thus finally returning to the common focus at F. The cross sections C A and A B of the outer surfaces of each zone are strictly speaking portions of parabolas, facing each other, meeting at the apex A at right angles, and also having their common focus in F, the centre of the hemisphere. In this manner as already explained a ray proceeding from the focus falls on the concave or first surface, enters without refraction, is totally reflected at the second surface in a direction tangential to the sphere at the apex of each zone, and passing on is again reflected at the third surface, and finally emerges from the opposite end of the inner or concave surface without refraction, whence passing on through the centre of the hemisphere, it becomes a portion of the anterior cone of rays, and being refracted through the lens L or reflected by the catadioptric rings C, C, C, C, (Fig. 9), finally emerges in the paths shown by the arrows, and adds its power to the effect of the pencil of rays R R R, which spread themselves out equally to every azimuth included in 180 degrees of the horizon.

To estimate the effective power of this instrument in comparison with those formerly described, we have the front cylinder of lenses acting on $\frac{4}{5}$ths of $\frac{1}{2}$ the sphere of rays, which deteriorate $\frac{1}{10}$th in passing through; we may safely estimate that not more than $\frac{1}{5}$th of the back hemisphere of rays escape the totally reflecting mirror, which cannot absorb more than $\frac{1}{10}$th of the rays falling thereon; we will therefore have the effective power equal to $\frac{9}{10}$ of $\frac{4}{5}$ of $\frac{100}{2} + \frac{9}{10}$ of $\frac{4}{5}$ of $\frac{100}{2}$ or 72.

In order to clearly judge of the relative merits of the above described instruments as applicable to fixed semi-horizon lights, let us make a short recapitulation by placing them side by side.

The flames in each being equal, the power of their whole sphere of rays will be represented by 100, and the effective results of each instrument will appear in parts of that sum, as below—

Paraboloidal reflector sends forth.......	35	parts of 100
Smith's periscopic ditto....	25	of „
Half of Fresnel's Dioptric refractor ditto.	36	of „
Ditto backed by hemispherical reflector do.	56	of „
Ditto backed by Mr Thomas Stevenson's totally reflecting hemispherical mirror,	72	of „

The first of these may at once be stated to be in principle and action, unfitted for semi-horizon fixed lights, as it requires 12 to 13 of them to illuminate half the circumference of the horizon, and in effecting which, as before stated, owing to its sending forth a beam or more properly a cone of light, whose rays are of unequal intensity, it cannot shed them economically. The next though sending forth greatly less light, as it perfectly and truly fulfills its office of distributing the rays over 180° is in its principle greatly superior to the former, so that were 12 of them compared practically with 12 of the former, it is not improbable that their efficiency would be found nearly equal. A great merit of Smith's periscopic reflector as compared with the paraboloidal is that the system allows of one of his reflectors being applicable not only for a harbour semi-horizon light of the smallest kind, but for a sea light of the largest, one of his reflectors being applicable for either provided its dimensions and flame be decreased or increased accordingly. Of course several small reflectors, if found more convenient for sea lights than one large one, which would require a mechanical lamp for its illumination, could be used instead. It is scarcely necessary to dilate upon the remaining three systems, as they have, in addition to higher power, all the merits and advantages of Captain Smith's periscopic reflector, whither as to correctness of principle, or facility of management, and it will at once be seen, that of these. Fresnel's apparatus backed by Mr

Thomas Stevenson's glass hemispherical mirror, by far exceeds the whole in effective power; this apparatus further possesses the great advantage, while equally small and compact as the rest, of being less perishable in its polish, thus not requiring the same trouble *in polishing* the plated mirrors used in those.

In taking leave of this part of the subject, it may not appear unopportune to glance at the relative merits of two propositions, in the system of maintenance of light-house illumination, which are, whether to employ cheap but comparatively inefficient instruments that can be made in the colonies, and which, not requiring the adjuncts of glass chimneys or other fragile furniture, can be trusted to the rough hands of ignor ant natives, or to employ instruments of superior workmanship, but which require the care of responsible and well-trained keepers to attend. It will be scarcely thought an argument deserving of much consideration, in favor of the former, however infinitesimal be the chance of their being extinguished by accident, that the cost of their attendance is cheap, and requisite furniture small, for whether the apparatus be rude or scientific, coarse or delicate, in the practical working of the system it will mainly if not entirely depend upon the character of the keepers, that the lamps burn without fail. A sleepy lascar would doze till the lamps went out, a responsible person would always be on the needful watch. And that the superior lamp of Argand, or even the yet more brilliant one of Carcel, should have opponents seems anomalous, when at least the former is universally employed by Europeans in India for domestic purposes without any difficulty, then how much more is their superior brilliancy and power called for, when they would be employed not for the comfort of a private individual or two, but for the guidance of our ships and the safety of their crews and passengers; wherever these traverse the coasts in numbers, there an efficient and superior system of light-house illumination will be required, and this can only be accomplished by properly trained and steady keepers, to whose care the most improved instruments could with great advantage to the maritime world be safely intrusted.

In point of economy in the consumption of oil,—the heaviest item amongst light-house stores, it will be found that the most improved apparatus has the highest merit; this, in the case of Fresnel's Dioptric apparatus backed by Mr Thomas Stevenson's glass hemispherical mirror, is as compared to the least powerful of those noticed in this paper in the ratio of 3 to 1 nearly.

On coasts where many lights burn, as already mentioned, it has been found necessary to introduce distinctions and an obvious mode of effecting this, instead of showing a constant steady light, is to eclipse the flame for certain intervals. The manner in which this is done is by causing the instruments to perform a circuit of the whole circumference of the horizon by means of machinery, and in their rotatory course they thus illuminate each point, as their luminous beam passes. For over sea voyages revolving lights are particularly advantageous, as the penetrating brilliance of their flash facilitates their discernment at far off distances. When a powerful light is required the introduction of the revolving system is the only means of obtaining it, and that the lights of this system do not show continuously, but have dark intervals is of no consequence, for the position of the vessels can always be taken by compass bearing at the bright period ; again on the near approach to a revolving light, that is within 5 or 6 miles, they do not totally obscure, for within this distance the naked flame of the lamps can be seen though the reflectors may not point their beam to the spectator. As an example of the economy of Revolving Lights, I may instance the Horsburgh one, lately erected on Pedra Branca ; this light-house has 3 groups of reflectors, which revolve at minute of time distances, each group pointing the luminous beams of 3 holophotal reflectors in the same azimuth to the horizon. One group of reflectors does not effectually embrace more than 6 degrees of the circumference of the horizon. The 9 lamps of this light-house consume about 40 piculs of oil per annum, the cost of which is 300 Sp. dollars. To obtain a fixed light showing as brilliant an appearance continuously in every azimuth as the periodical flash of this light-house would require 180 lamps, which in the item of oil alone would cost annually the sum of 6,000 Sp. dollars.

When Revolving lights are placed on a coast, and not on an island or a rock out at sea, they, as mentioned before, expend half their revolution uselessly, as during the circuit they point their reflectors landward, where their light is not required. With the view to save the useless expenditure caused by this circumstance Captain Smith of the Madras Engineers, invented his reciprocating light, which he adapted to the beautiful Pharos pillar constructed by him at Madras. His description of the invention is to be found in the transactions of the British Civil Engineers vol. 2, page 193, from which the following extract will suffice to make known the peculiarity of the mechanical arrangements :—

" The whole of the reflectors are fixed in their proper positions " to a reflector frame attached to a central spindle, placed verti- " cally, and to which motion is communicated from a machine " of common construction (moved by a weight and regulated by " fans) by means of a couple of bevelled wheels, one of which " is fixed on the vertical spindle just mentioned, and hence " revolves in a horizontal plane, the other turns in a plane at " right angles to the above on a vertical plane, its arbour or " axis, being at right angles to the spindle. Now if instead of this " single vertical wheel acting continually on one side of the hori- " zontal one above mentioned, another one be similarly situated " on its opposite side and engaged in the teeth on its margin, " these two wheels are mounted on the same arbour and conse- " quently turn in the same direction, it will be evident that they "would if successively engaged produce opposite motions in the spindle and the apparatus, but that if both were engaged at the same time, no motion at all could be effected, since by their opposite tendencies they would act against each other.

"This successive action, therefore is effected by fixing both of the wheels upon the arbour in the same manner as if they were singly employed, that is with their teeth engaged at the proper pitch, in the horizontal wheel above them, and then by cutting away those of the alternated semi-circumferences of either, so that while those are engaged and produce motion in one direction, the blank circumference of the other is presented and the moment the former ceases to act, the teeth of the latter come into play, producing an opposite movement.

"This apparatus upon execution and trial was found to produce the intended effect, very steadily, but I soon observed that however satisfactorily it might act, when well set up, it was incapable of withstanding the effect of those disturbances, which long friction and wear of the parts, or accidents and ill-treatment might subject it to, and without a perfect security against which, I should have felt it unsafe to dispatch it to so distant a settlement. The reason of this will be seen by reference to Fig. 10, in which A C B represents the horizontal bevelled wheel, and E D F represents one of the vertical wheels above alluded to, at the very moment when the last tooth is escaping from its engagement with the horizontal wheel, and when the change in the movement is about to take place; now the conditions of the light demand that there should be no material loss of time in reversing the motion, that is, that the movement from C to A in the upper wheel, should commence in not more than a second or two after that in the direction of C to B caused by the action of the wheel E D B has ceased. Moreover, it will be plainly seen that as the change of motion which ensues after the tooth D has quitted its hold, causes the whole range of teeth from C to B immediately to return in the direction of K passing over the head of D, there would be some risk (more particularly if by any derangement the wheel B C A should have become swayed out of its proper position, and its edge fall below the line H K), of these teeth striking the top of D, on their return, or what would be as bad of their failing to disengage it at the proper time, unless before this return movement commenced the top of D had dipped sufficiently below the line of their path H K, to be out of the reach of any such accident.

"But it unfortunately happens that at the very point only where the tooth D is situated, the dip below the horizontal line occasioned by the curvature of its path amounts to nothing, (being represented by the versed sine of the angle formed by the radius drawn to it with the vertical C G) and is hardly perceptable, till it has reached a considerable distance from the vertical position, so that before it would have amounted to $\frac{1}{8}$th "of an inch which I satisfied myself would be sufficient to "place the security of the movement beyond the reach of "probable accident the delay or loss of time would have "amounted to not less than 7 or 8 seconds. It occurred "to me however that if I could make the final connection "between the wheels by means of a tooth situated on a part of "the wheel E D F, endowed with a more oblique motion, that it "would then be in my power, even to increase the clearing space "above mentioned if necessary, without the sacrifice of any material delay; with this view I designed the tooth represented in "the figure by dotted lines, and it ought to be more properly "termed a cam or snail, as it acts upon a short straight pin, "projecting from the side of the horizontal wheel, and communicates to it precisely the same motion, as it would receive from "the teeth, which now become unnecessary and might be entirely "removed. In order to ensure the exact equivalence of the "motion to that for which it is substituted and to cause the cam "to follow close to the circumference of the upper wheel, its edge "has a double curvature, that of M N which is seen in the figure "being a cycloid, formed by the circle D E F, and its face is "also twisted in a spiral direction in order to accommodate it "to the varying inclination of the spiral pin it acts on. The "adoption of this simple contrivance has completely obviated the "difficulty which seemed to stand in the way of perfect success, "and since it has been applied, although the interval elapsing "between the motions is only two seconds, I have found the apparatus to work so completely free from the risk I was apprehensive "of, that I have found it as yet quite unnecessary to do more than "merely file the tops of the last two teeth, amply sufficient space "having been gained by that means; but it may perhaps be "advisable to remove a little more previous to transferring the "machine to the management of the rude hands, to whose care it "will in future be entrusted."

The inventor precedes the above description of his Reciprocating Light, with the following remarks:—"This system of "illumination is obviously inapplicable to situations, where from "the multitude of beacons on a dangerous coast, it becomes "necessary to have recourse to observations on the length of the "eclipses, or to the time elapsing between the periodic recurrence "of the flashes as the means whereby the particular light is to "be determined. But it has hitherto I believe been found unnecessary in British light-houses, to rest entire dependence on the "differences in the periods of revolution and it appears prudent "to avoid having recourse to this means of discrimination, since "it is the least secure, and open to various objections. Where "however this system is indispensable, the reciprocating light "cannot be used, for although the total quantities of light and "darkness seen by a spectator in every position are constant, yet "from the peculiar nature of the motion, the duration of the

“ flashes and eclipses vary with every new position of the ob-“ server, a circumstance which if not understood, might lead to “ mistake and fatal consequences.”

“ These remarks however apply only to those cases, where from “ the existing number of similar works, it becomes important to “ avoid the danger of confusion, and are inapplicable when it is “ proposed to adopt it in situations sufficiently remote to be secure “ from the liability of incurring that evil. In the present case “ for instance, the reciprocating light to be erected at Madras will “ be the only moving light on the whole coast of India, and “ hence cannot possibly be mistaken for any other at present in “ existence; but I consider it would be equally safe to introduce “ the system, wherever the determination of the precise periods “ does not enter as an indispensable condition, and in such situa-“ tions it will be strongly recommended by its economy, as the “ annual saving effected by it, will be found to be well worthy of “ consideration, in addition to its being attended by other advan-“ tages, such as the reduction of weight and bulk, superior cheap-“ ness in first cost, and diminution of the labour requisite to keep “ the apparatus in order &c.

The peculiar action of the instrument, will be made more plain to the general reader by the accompanying diagram (Fig. 11). Let f be the upright spindle on which the frame with its lamps turns, a a' a'' a''' are the reflectors, which by means of Captain Smith's invention are made to reciprocate respectively between the points b c, c d, d e, e g, thus bringing 180° of the whole circumference of the horizon under their influence; now were each reflector to move over its appointed arc of the horizon in 1 minute, and of course back again in the same period, the spectator in approaching the light-house from the direction of h, would have the flashes upon him exactly at minute of time intervals, first the flash from a,'' and then the flash from a,''' alternately; but let him approach from the direction i, he would have a flash upon him every ½ minute and 1½ alternately; again were he to approach from k, he would have them at ¼ minute and 1¾ minute intervals, and so on. The intervals of obscuration would vary according to his position, owing to which circumstance, as stated by the author, the light could not be distinguished by its periods in the manner that revolving lights can be known from each other.

In the practical working of the system, the inventor was only able safely to fulfil the conditions of lighting ½ the horizon at ⅜ths of the expence of revolving lights.[*]

The next invention for an eclipsing semi-horizon light, is that what its inventor, Mr Thomas Stevenson, terms a reversing light.[†] In his description of it he states, that, “ to effect the same econo-“ my which the reciprocating light secures, and at the same time

---

[*] Trans. C. Engineers, vol. 2, p. 196.

[†] Account of Holophotal system, p. 18.

" to obviate the disadvantages referred to, the following plan will I " think be found in every way suitable. Fig 12 shows a ground " plan of the apparatus, in which A B C D, represent the frame, " having toothed segments in its periphery,—R R are the reflectors and lamps, which have a vertical spindle passing through " their common centre of gravity. On the lower end of this " spindle a small pinion wheel e is attached and on separate " standards there are two concave toothed segments F F, placed " at the same level as the pinion wheels, and at opposite points " of the circle. Let it be supposed that the side which is to be " illuminated, is the half of the horizon marked G H D, which is " next the sea, while the landward side D J G, is to be kept dark. " As the frame A B C D, is made to revolve, by the ordinary " machinery of the light room, wor-ing on the large toothed " wheel at the point K, the reflectors will have their directions " reversed, whenever the pinions at the end of their spindles come " into gear with the fixed concave segments F F. The reversing " segments F F, have just as many leaves as are sufficient to " turn the reflectors backward through an arc of 180°, and to " prevent any casual obstruction from causing the reflector to " alter its position before it reaches the other reversing segment, " a small spring acting as a pall secures it in the exact position " which has been given to it by the last tooth of the segment. " It is hardly necessary to observe that one large reflector may " be made on the same principle to illuminate half the horizon.

" From the description that has just been given, it will be very " easily seen that the reflectors will be arranged as if on the outside of the cylinder while they are on the seaward arc, and on " the inside of the hollow cylinder while they are on the landward arc. Each reflector and lamp is turned with its face " toward the centre of the apparatus, on coming into gear " with the fixed segment F. I think it proper to mention, that I " have been favored with the sight of an elegant and ingenious " plan for effecting the same objects, by Mr J. T. Thomson, the " Government Surveyor at Singapore. As I do not consider myself at liberty to give any description of this instrument, I shall " merely mention that it appears to me to be well suited for " fulfilling the required conditions, although not perhaps so " rigorously, as the plan above described, and certainly not so simply."

With so good an introduction for my eclipsing semi-horizon light, it will scarcely be necessary for me to offer apology for bringing it to public notice. It may with propriety, I think, be termed a semi-revolving light. In Prop. XX, Book III, Euclid, it is demonstrated, *that the angle at the centre of a circle is double the angle at the circumference upon the same base, that is, upon the same part of the circumference.*

Let A B C D E F, (Fig 13) be a circular frame, revolving on its centre G, and let F be a point on the circumference; now suppose reflectors were placed at the points A B C D E F, which while revolving on the circle A B C D E F, are at the same time directed in the pointing of their luminous beams by straight rods or rules F A, F B, F C &c., it will be evident that the reflectors while performing their circuit in passing from F to A, traverse an arc measured by the angle F G A, but the luminous beam of the reflector in the same time will have only traversed an arc measured by the angle A F b, which is equal to half the angle A G F, F b being a tangent to the circle at F, the arc b A, which is measured by the angle A F b, is consequently half the arc F A, which is measured by the angle A G F; in the same manner the reflectors in traversing from A to B, on a centre at G, will describe an arc measured by the angle B G A, which is double the angle B F A, the arc B a, which is measured by the angle B F A, is therefore half the arc B A, measured by the angle B G A. This will be the same with all other arcs of the circle, so that while the reflectors have performed the whole circuit of 360°, their luminous beams will only have performed 180°.

In a machine constructed exactly on this plan, a practical difficulty would occur in reversing the reflectors at the point F, from c to b, and this can only be overcome by putting the point F within the circle, as in Fig. 14. Now were reflectors put on a frame A B C, revolving on its centre at G, then the reflectors a a a placed upon it, and being guided in their manner of facing by straight sliding rules, with slots down their middles, which rules would be fixed to the reflectors, and slide on a vertical round pin held fast at F (the friction of the straight rules, against the fixed pin, might be lessened by their being made to run on small sheaves) the luminous beams proceeding from the reflectors would for all practical purposes fulfil the required conditions, viz. illuminate at equal intervals every part of 180° of the sea horizon, and waste none of their light landward.

What appears to me to be as effective a plan, but which is by no means so simple, though founded on the same principles, will be seen in Fig. 15; in which A B C is a circular frame, revolving on its centre at G, bearing the reflectors, and D E F a smaller circular frame revolving on a centre at H, eccentric to the larger, but performing a revolution in the same time; a a a a, are straight guide rods, which being fixed to the reflectors at c c c c, slide through holes in the heads of the pins b b b b, by which means the reflectors act in the same manner as those described in Fig. 14.

The manner in which equal motion is given to the frames, will be seen in Fig. 16, in which a a are two driving pinions of equal size, which are fixed upon the same shaft b, and may be connected with the usual light room machinery, c and d, are wheels of equal size, the former of which is fixed on the shaft e, which gives motion to the smaller frame, and the other is fixed to the larger frame, but instead of turning upon a shaft or spindle, has motion round the periphery of the disc. f f. It will be observed, that the disc f f is concentric with the larger frame but eccentric to the smaller, whose shaft e passes through it. My attention was first directed to the subject of semi-horizon eclipsing lights, by reading Captain Smith's account of his. This was in 1844, when I was engaged in the design for a light-house on Peak Rock, at the South Eastern extreme of the Malay Peninsula, where a light would not require to show all round. At that time I designed the above, but since then have had neither means nor opportunity to apply them in practice, by which, whatever their merits or demerits be, they can only be fairly judged of.

The author of an invention is apt to see with the too partial eyes of a parent, I will therefore not institute comparisons, but only confine myself to suggesting that the reversing and semi-revolving lights, while they are suited to carry every kind of reflector used in revolving lights, will effect a saving to the extent of fully one half in the expenditure of oil and other necessary articles, while their original cost will be much smaller than the latter.

For the purposes of navigation, they will fulfil the important condition of showing light in every direction to seaward, in the same manner and equally well as revolving lights.

The late introduction of the holophotal system of Mr Thomas Stevenson, would seem to make the introduction of eclipsing semi-horizon lights of much more importance than before these admirable inventions of that engineer were known, whereby small arcs of the horizon are illuminated by lights, (both dioptric and catoptric) of maximum intensity, which from the nature of their performance are exceedingly well adapted to eclipsing lights. The eclipsing dioptric lights of Fresnel have no advantage over them with regard to intensity, and the system of that engineer being only adapted for totally revolving lights, if placed on a coast, would be worked at double the cost of the semi-horizon apparatus when aided by the most powerful of Mr Thomas Stevenson's holophotal instruments.

For such positions on coasts, which ships make from over sea voyages, and which may now be lighted for economy's sake by the inferior power of a fixed light, the more powerful eclipsing semi-horizon lights would be introduced at the same or less cost of maintenance, to the great comfort of the mariner, to whom the greater brilliancy of the flashes would be of the utmost consequence, by enabling him to descry them at great distances, a desideratum which would be fully appreciated by those who on approaching dangerous coasts were uncertain of their correct Latitude and Longitude.

THE SEA-SWALLOW.

As we were passing the Carimata Islands, off the western coast of Borneo, we were visited by the tern or sea-swallow, which I had seen in my former passage up the China sea, not many hundred miles from the same spot, as this species has a certain range among the islands that strew the sea between Borneo and Sumatra. The bill and feet are deep black; the throat and under parts of a snowy white. All the upper parts are of a brownish black, which reflects a peculiar redness when the sun falls directly upon them. The feathers upon the head, nape, and back, are edged with white; hence the smaller the feathers on any part, the greater is the quantity of white. There is a white line also over the eyes. The purity of the white is admirable, which appears the more striking because it is contrasted with the black. The tail is forked and long, as are also the wings. But, notwithstanding the advantages for flight, the bird is soon tired, owing to the rapid and incessant motions of the wings. When tired, it cannot rest upon the wave, as the petrels and other sea-birds do, but is obliged to seek for some object whereon to alight. When it comes on board ship, it is generally very fatigued, and glad to repose under any circumstances; hence they are thought to be very foolish birds, and have obtained the whimsical name of noddies, in allusion to their want of head-piece. The one I am describing had a black and lively eye, and rested with great composure in the cabin while I took a sketch of it; but as the wings were dropped or raised to rest the different muscles, the outline and attitude were so often changed that it turned out to be a very stiff and unfaithful likeness.—*Lay's Voyage of the Himmaleh.*

Fig. 1.

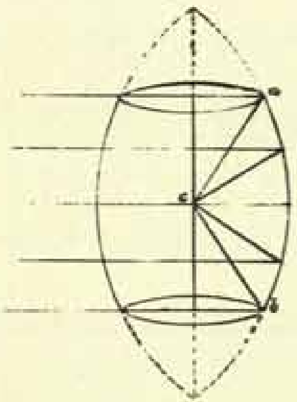


Fig. 4.

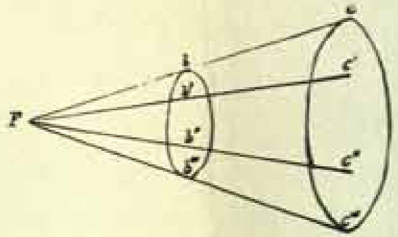


Fig 7

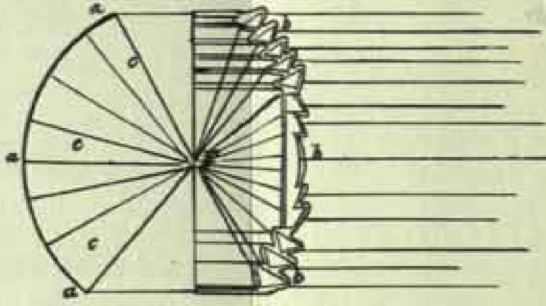


Fig. 5.

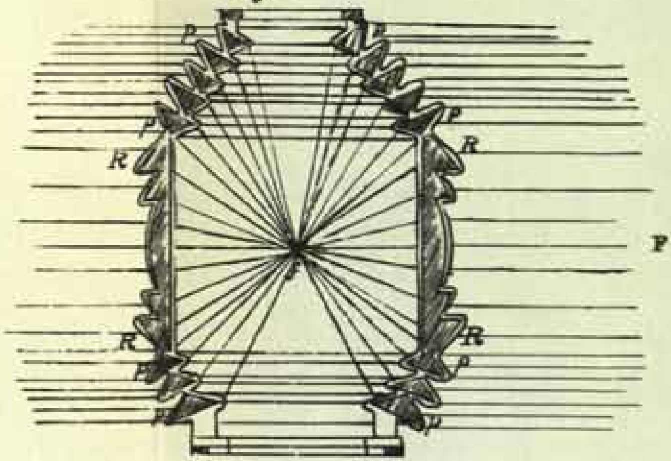


Fig 8

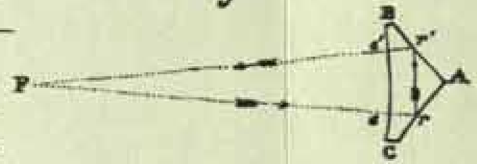


Fig. 2.

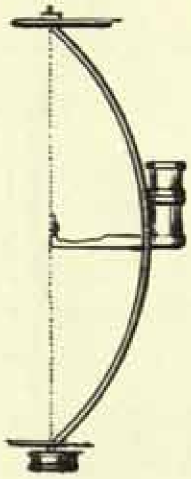


Fig. 3.

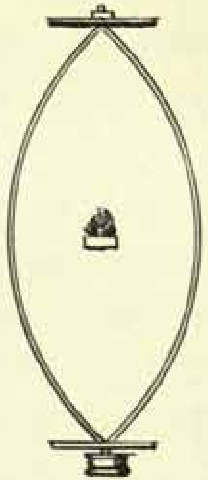


Fig. 9.

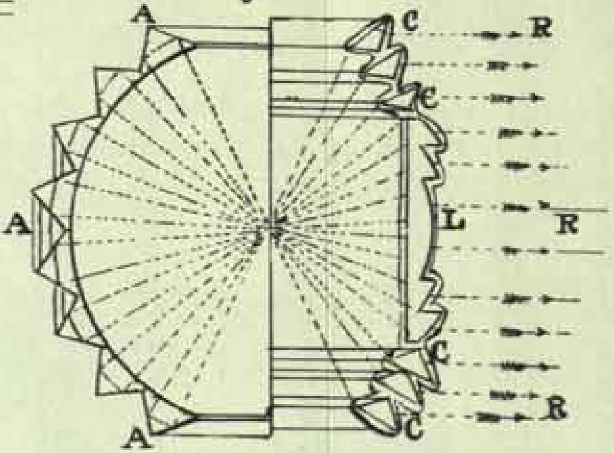


Fig. 6.

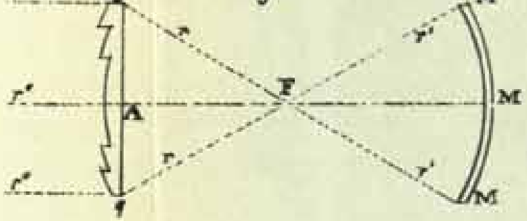


Fig. 10.

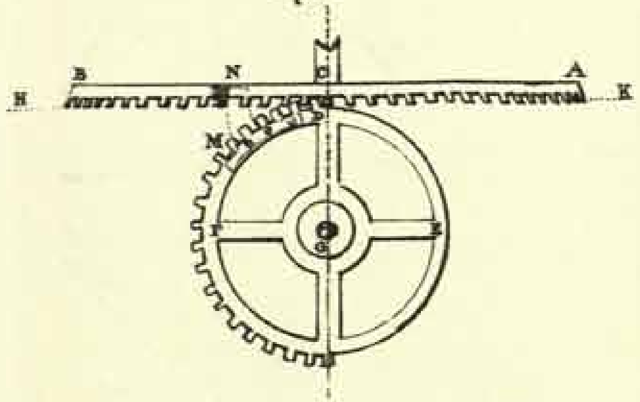


Fig 13

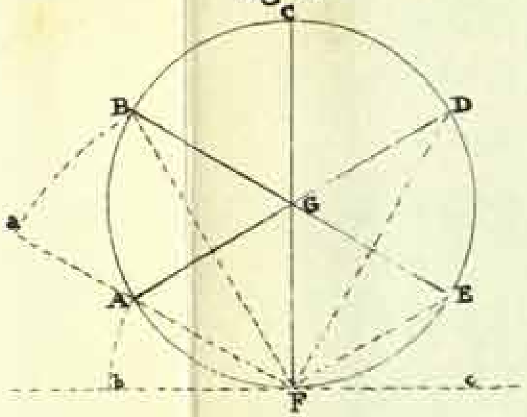
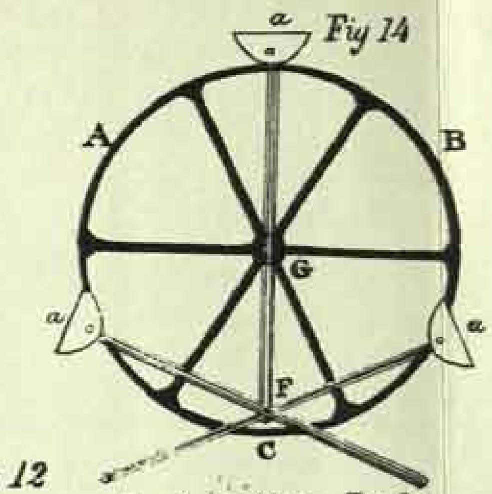


Fig 14



Semi revolving Light

Fig. 16.

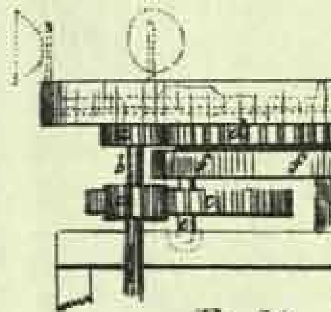
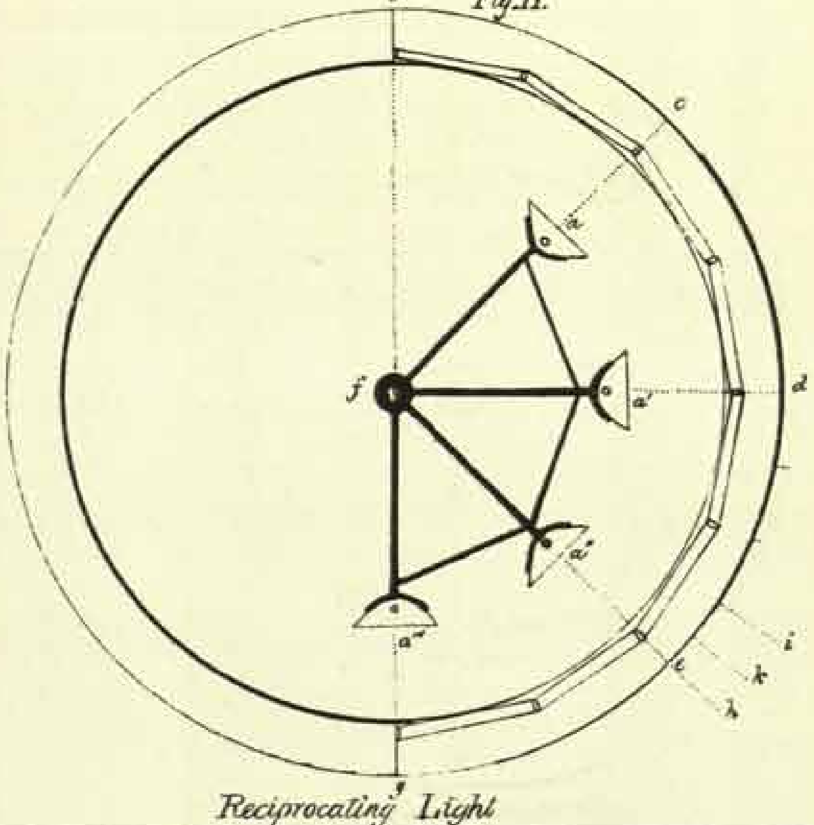
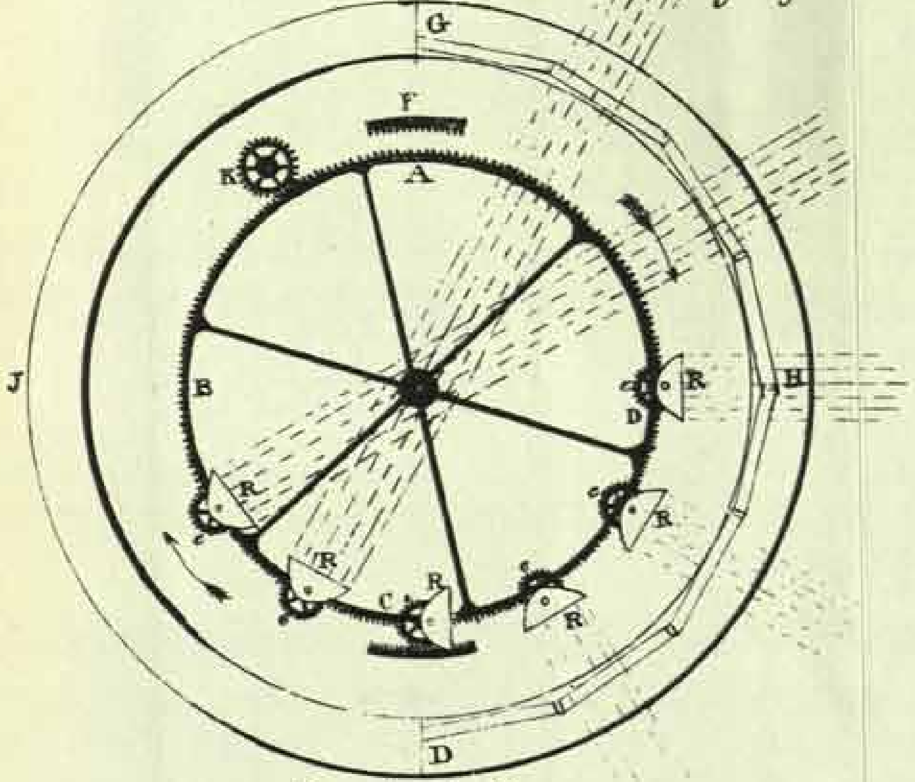


Fig. 11.



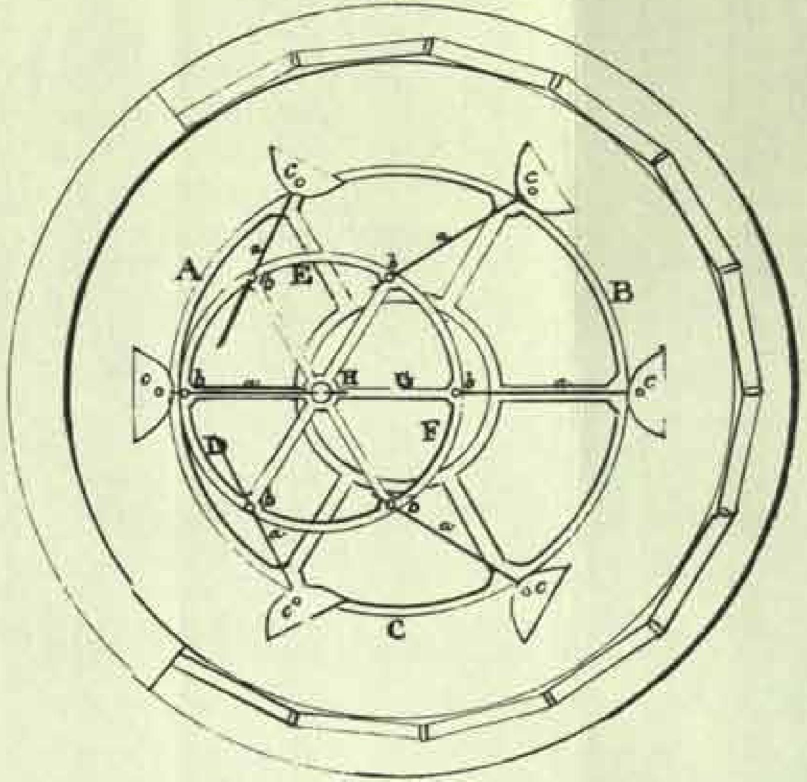
Reciprocating Light

Fig 12

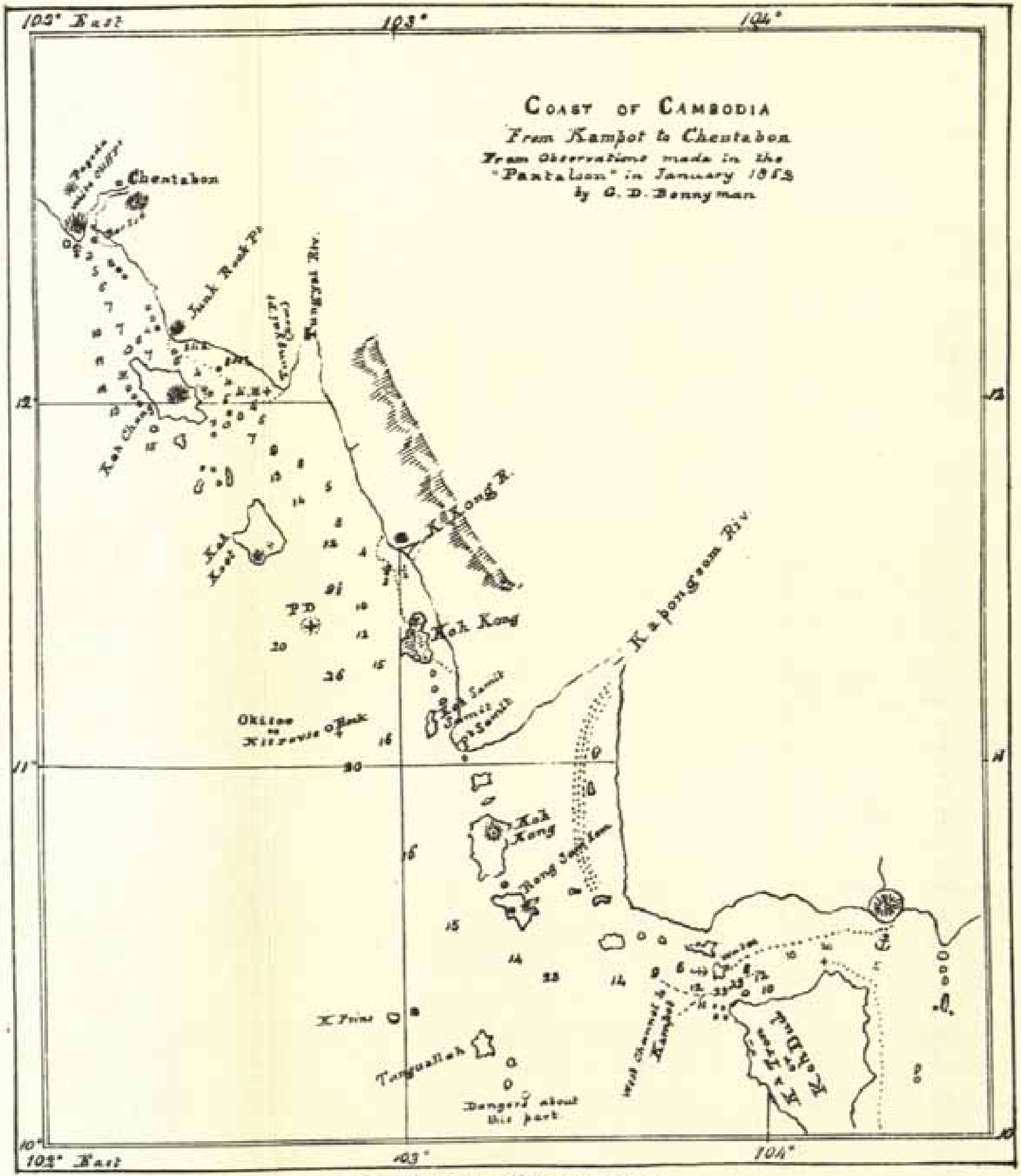


Reversing Light

Fig 15



Semi-revolving Light



Lith. Singapore Free Press Office.

THE
JOURNAL
OF
THE INDIAN ARCHIPELAGO
AND
EASTERN ASIA.

NOTICES OF THE COAST OF CAMBODIA FROM KAMPOT TO CHENTABON.

By Captain G. D. BONNYMAN.

[A very interesting notice of the Port of Kampot, with directions for the Eastern channel, appeared in the number of this journal for July last, (vol. v. p. 430) and we are again indebted to Captain Bonnyman for some valuable information concerning that locality. The Gulf of Siam has never been systematically surveyed, and European intercourse with the east coast of the Gulf having ceased for nearly a century before it was re-opened from this port a few years ago, the coast line continues to be laid down in modern charts from the tracings of early European navigators, whose observations were made at the time when hydrographical science was in its infancy. Intercourse with Siam and the eastern side of the Gulf is rapidly increasing, no less than six square-rigged vessels belonging to the Port of Singapore, of the aggregate burthen of 1,036 tons, having arrived here with cargoes direct from Kampot since Christmas, a period of less than three months. The time has therefore arrived when commercial interests require a systematic survey of the entire Gulf, but in the meantime navigators will gladly avail themselves of the information so liberally tendered by Captain Bonnyman. Shortly after the return of the *Pantaloon* to Kampot from the trip that is detailed below, intelligence was received that a large ship, which had been seized by the Chinese emigrants on board, had arrived on the coast to the south of Kampot, where she had been abandoned. The *Pantaloon*, accompanied by the *Polka*, also belonging to this port, proceeded in search of her, and although unsuccessful, (the ship having being brought to Singapore by the survivors of the officers and crew) the necessary close examination of the shore enabled Captain Bonnyman to fill up the coast line from Kampot to the South Point of Cambodia, so that we shall soon be able to give a lithographed sketch of this part, which will complete the entire western coast line of Cambodia.]

KAMPOT. *Western Channel.*—The channel to the eastward of Koh Tron or Koh Dud has hitherto been most frequented by ships resorting to Kampot, but it is not well suited for vessels of a large class, as a spit, with only 3 fathoms water upon it in some places, extends from the Twins in a northwesterly direction, nearly the whole distance across the channel to the Koh Dud shore, forming a sort of bar, with overfalls which are alarming to strangers. The western channel, on the other hand, has depth of water sufficient for the largest ship, but the navigable part is contracted by a shoal or reef which lines the coast to the westward of the anchorage, and extends more than mid-channel across towards the Koh Dud shore. This shoal reaches as far as the islands which lie in the entrance of the channel, and it must be approached with caution, for near the edge of the bank the water shoals suddenly from 5 to 2 fathoms. The lead is the best guide. A reef, visible at low water, also extends 1½ miles from Rocky Point, the north extreme of Koh Dud. The north end of Temple Island on with a small cone-shaped hill or island between Peaked Island and the Kep Mountain, leads clear of this reef, with no ground at 15 fathoms. With the *south* end of Peaked Island in transit bearing with the cone-shaped hill, the soundings are 5 fathoms, close to the end of the reef. When bound out by the western channel, a W. S. W. course after passing the reef of Rocky Point leads up to the widest opening through the islands lying in the entrance of the channel, which are visible from the Road of Kampot. The north side of Koh Dud forms a deep bay, into which a vessel may stand with safety should she have to work through the channel.

MIDDLE ISLAND or Tian Moi, is the leading mark for the mouth of the western channel. It is a tolerably large island, of moderate elevation, with a few fishermen's huts on the south side. On the north-west side there is a small sandy bay, in which a vessel can anchor in 4 fathoms about half a mile off shore, and fill up her fresh water very expeditiously. The watering place is indicated by a clearing in the forest, made by the crews of native vessels which resort to the spot to procure fire-wood. A ship's long boat can lie close alongside the beach, and as the watering place is only a few paces distant, the casks can be filled with great convenience. There is a small round islet on the west side of Middle Island which must be approached with caution, as a spit projects from it about a mile to the S. W. The space between Middle Island and the extreme of the mainland is chiefly occupied by an island of a larger size, called Ta Chi Chow.

The navigable channel lies to the south of Middle Island, between it and a cluster of islets and rocks called Kappan Moi, which lies off the north-west point of Koh Dud. The soundings in mid-channel are 23 fathoms, and the cluster of rocks which bounds it to the south, appears to be steep-to.

There is a group of islands some distance out from the western entrance, the principal of which is a peaked island called Tankwalla, in Lat. 10° 19' N., Long. 103° 11' E. Some dangerous reefs exist in their neighbourhood, but the channel between them and Koh Dud is safe, with soundings in from 15 to 20 fathoms.

Rong Sam Len is an island about 30 miles in circumference with several sandy bays on its outer side. The south point is in Lat. 10° 34' N. Long. 103° 18' E.

Koh Rong is about 12 miles long, and like the former is moderately elevated, and covered with trees. There are two bays on the west coast in which we saw some white cliffs. The point of land which separates them is in Lat. 10° 44' N. Long. 103° 10' E. Both islands are uninhabited.

These islands front a deep bay called Ka Pong Som, at the head of which is a river of considerable size. As the town of Ka Pong Som, which is under the Cambodian government, was said to be two days journey up the river, we did not visit it. The trade is represented as inconsiderable. Samit, the western extreme of the bay, is in about Lat. 11° 4' Long. 103° 07. It was passed during the night. The island Koh Samit lies close to the westward of the point.

Okisoo or Kusrovie Rock, a round islet about 35 feet high and bare of vegetation, lies to the westward of Koh Samit, distant about 20 miles. It appears to be steep to except on the S. E. side, from which a small reef projects. We made it in Lat. 11° 7' N. Long. 102° 48' E. from its bearing and distance from the position of the ship at noon, the distance being estimated from the height at which the surf line was visible. As we were becalmed in this position until night, we had no opportunity of settling the point by cross bearings. This rock is in a transit with Koh Koot, bearing N. 22° W. (true.)

Koh Kong, a large high island covered with trees, lies near the coast to the north-west of Okisoo. It is inhabited by a few gamboge collectors and fishermen. The highest and southernmost of two quoin-shaped hills, which forms a peak, is in Lat. 11° 24' N. Long. 103° 2' E. The north extreme of the island must not be approached too closely, as a shoal extends from it parallel with the coast of the mainland, and is continued to the northward beyond the mouths of the Koh Kong river. There are three entrances to this river, but the northern-most is the principal. It may be distinguished by a round hill near the sea which makes like an island when seen from the offing, and also by the trees on the north bank being much higher than those on other parts of the coast. When standing in for the bar the soundings decrease very regularly. We took up our anchorage in 3 fathoms about 4 miles off shore, in Lat. 11° 32′ N. Long 102° 56′ E. from which the following bearings were set:—

Koh Kong Peak................	S. 35° E.
Peak of Koh Koot..............	N. 80° W.
Mouth of the River..............	N. E. by E. ½ E.

These bearings put a ship close to the bank which has already been alluded to as extending from Kok Kong along the coast to the north.

There is no town here, the inhabitants being scattered in villages erected along the banks of the river. The principal trader, who is also chief of the place (for there is no regular governor) resides at a village about four hours' pull up the north branch. There is very little trade, the only article exported in considerable quantity being gamboge, which is sent to Bangkok for sale. It can only be purchased on the spot with Siamese *tikals*, the people refusing to take goods in barter. The inhabitants appear to be in a state of great poverty, and to be but little advanced in civilization. The place is under the rule of Siam.

From the Kong river the coast extends about N. N. W., and begins to change its aspect, rising into long ridges of table land and numerous peaked hills, over which are seen a distant range of very lofty mountains. The general direction of the ranges appears to be from N. N. W. to S. S. E. There is said to be no settlement on the coast between Kong river and Tung Yai. A chain of islands extends parallel with this part of the coast, the southernmost of which is

KOH KOOT, a high and level island, well-wooded, and without permanent inhabitants. A conical hill near the south-west extreme of the island, the height of which by trigonometrical measurement is about 1,014 feet, is in Lat. 11° 36′ N. Long. 102° 34′ E. The soundings between the island and the main are regular, in from 12 to 14 fathoms, decreasing gradually towards the coast.

KOH CHANG, which terminates this group to the north, (the intermediate islands being small and presenting nothing worthy of notice) consists of a mass of peaked hills separated by precipitous ravines. A table hill near the middle of the island, upwards of 2,000 feet high, is in Lat. 12° 1½′ N. Long. 102° 23′ E. On the north-east part of the island are some huts, where a sort of Coast-Guard is stationed.

TUNG YAI Point, the extreme of the land which forms the western boundary of the entrance to the Tung Yai river, has the appearance of a low woody island when first seen from the southward. It is in Lat. 12° 2' N. Long. 102° 39' E. The channel into the river is said to be close round the point, and along the land to the north. We did not visit it, as the trade is inconsiderable, and the rice and pepper which are the chief exports, are carried to Chentabon.

The channel between Koh Chang and the main land is much contracted by an extensive bank which stretches from the main land half way across the strait, with rocks above water on some parts, and a dangerous ledge only visible at low water spring tides on its south-west side. While beating through this channel to the N. W. against a strong head-wind, with a considerable sea running, we saw no appearance of breakers, but a native boatman who was my informant assured me of its existence, although he could not point out its exact position. He described it as being about the length of a ship. To avoid this ledge, it is prudent to tack when the water shoals to 4 fathoms while standing off from the rocky islets which front the east side of Koh Chang. These islet are safe to approach, as the soundings are 4½ to 5 fathoms pretty close to, but the passage between the islets and Koh Chang should not be attempted. Junk-Rock Point, at the north-western entrance of the Strait, is in Lat. 12° 10' N. There is a rock 3 or 4 feet above water off the point, to the south of which lies the fairway, with soundings in 6 fathoms. The southernmost of the cluster of islets close to the westward of the point has a reef projecting from it to seaward. When rounding the point a ship should be prepared to encounter sudden gusts of wind which sometimes blow with great violence for a time. From Junk-Rock Point the land trends N. by W. and N. N. W. to

CHENTABON RIVER, which may be known by a white cliff on the point which forms the western side of the river's mouth. This cliff is a good land-mark. It is composed of an indurated clay, which has become white, and assumes the appearance of chalk. As the water shoals gradually towards the shore, a ship may anchor to the southward of the cliff in any depth that is deemed necessary. The following bearings were taken from the anchorage a mile to the south of the cliff in 3½ fathoms at low water:

Haycock Island....	W. by N.	distant 1½ mile.
Bar Island.........	N. E. by E.	„ 1 „
Chentabon Hill....	N. 57° E.	
Koh Chang (centre)	S. 37° E.	

Vessels of light draught can enter the river by the channel between Bar Island and White Cliff Point, but as it is very narrow, it would be necessary to warp in with a head wind. The inner anchorage is near the fort, in 3 or 4 fathoms. Bar Island has a remarkable rock on its eastern side, standing detached.

There are two forts near the mouth of the river, one on a rising ground inside White Cliff Point, and the other on a sandy point on the east bank. The latter has embrazures for forty or fifty guns, but only 10 of large calibre and 4 smaller guns are mounted on the sea face. The wall on the opposite side, which abuts on the river, is giving way, probably from the nature of the foundation. The fort is in Lat. 12° 27'' 07' N. Long. 102° 8'. The difference of longitude from Kampot given by the Chronometers places it 4' further west, but the sudden change of temperature had so altered the rates of both watches, that comparatively little dependence could be placed on their results. I have therefore adopted the longitude given above from the bearing and distance of points whose position we had previously ascertained. High water at the fort took place at noon on the day of the new moon, and on the two following days it occurred about the same time. Rise and fall 12 feet. The flood ran 9 hours, and during the remaining 15 the ebb set out with great strength.

The town of Chentabon lies N. E. of the fort by rough bearing, distant 9 or 10 miles, but the windings of the river nearly double the distance. It consists of a large number of houses, mostly of bambu and atap, erected on the right bank of the river. The Governor, who at the time of our visit was superintending the construction of a fort below the town, received us well, and made no objection to our visiting Chentabon, but at the same time gave us to understand that Bangkok was the only port open to trade. Our stay was therefore short, and our passages up and down the river having both occurred during the night, I can afford little information concerning the country. The banks of the river are low, and in the neighbourhood of Chentabon the land is well cultivated. Further inland the country is undulating, with some hills of considerable height. The inhabitants seemed active and industrious, and at the time of our visit were busily employed in getting in the harvest. They shewed us much civility and hospitality, and I regret that we had not occasion to spend more time among them.

The produce of the surrounding country is sent to Bangkok, cash advances being made by merchants there to enable the producers to cultivate the ground. Rice was cheap, but not abundant. The weather was exceedingly cool while the strong north wind prevailed, the thermometer being as low as 65° at sun-rise.

On the return voyage to Kampot we passed outside all the islands. The outer line of soundings in the accompanying sketch will point out our track. We met with nothing worthy of attention that had not been observed during the previous passage along the coast.

ON COFFEE PLANTING IN CEYLON.

By C. R. Rigg, Esq.

The high prices of Ceylon Coffee in the home markets, and the reputed fertility of the "Pendant jewel of India," as Lankadiwa has been called, induced many men to proceed thither and rush headlong into Coffee planting between 1840 and 1844. It is amusing to call to mind how many of us made a mystery of the object we had in view, all afraid lest too many should enter into the undertaking; it was never regarded in so equivocal a light as a speculation. It was only to those intimately interested in our success that even the green, leafy covering of our views in life was exposed, whilst a peep at the golden harvest was granted exclusively to the few who warmed their toes on the same fender, when the short hours of a winter's morning still found us dilating on the El Dorado of our imaginations.

Of the hundreds, who, between January 1841 and December 1844, arrived at the "Spicy Isle," or impowered agents to invest their money in cultivating the Arabian shrub, perhaps 90 per cent have lost their all: 7 per cent more have managed to pick up sufficient of the fragments of their once stately barque to build a little boat and have escaped from the floods which ingulfed so many: 2 per cent took the hint in time and got clear off, whilst the odd 1 may have made a fortune.

As a body the planters of Ceylon have themselves to blame for very much of their disasters, though individually most may plead that they went with the stream. An infatuation appears to have possessed them and they slumbered on, like the narcotized opium smoker, who having filled his lungs with the fumes of the pernicious drug, throws himself back on a couch, his nerves stimulated and his muscles flaccid for a time, whilst his mind wanders in fairy scenes and pictures future ease and repose. But time wears away the veil, he begins to be conscious, he feels a tightness in his chest, he awakes to the reality of his position—all his bright visions have turned to gloomy forebodings and blue-devils, but he cannot extricate himself, he is tangled in the meshes of the toil which he has woven round himself. Such, it must be confessed, was the diseased state of public mind in Ceylon; nothing was thought or talked of but planting, and that not in a rational way, but with an *entetement* scarcely to be credited. The great object appeared to be spending money, and one of the strongest recommendations to a superintendent out of place, was that he had spent so many thousands of pounds, on so few acres for his last employer. Those most deeply interested in the undertaking were perhaps most anxious to get rid of their money, expecting of course the greatest returns. To such an extent was it carried that

I knew a Scotchman, who passed in those days for a knowing hand, absolutely plant a field with Coffee in the height of a dry season. The mania for planting in Ceylon was as great and as disastrous in its small way, as the Railway-furor in England, the absurdity of which the planters saw through at once. The Governor and his Civil Servants dabbled in the speculation and scalded their fingers. High Civil and Military Officers, both of Her Majesty and the East India Company, entered into the enterprise, many of them far beyond their means. Merchants, tradespeople and private individuals all took tickets in the lottery, drew blanks and when too late regretted it.

> Freely the faults of our neighbours we blame,
> But tax not ourselves though we practise the same.

The most extravagant estimates were published and circulated at home, bearing such good names that their correctness was never doubted. One I remember made out that 300 acres might be planted, kept up, and all the Coffee to the end of the 5th year from commencement, be housed and cured for £3,040, whilst the produce during that time would sell on the estate for 35s per cwt or £4,230 for the whole, leaving a net balance of £1,190 profit in five years and a property worth £ 15,000. Such statements, emanating from the sources they did, could not fail to entrap many even of the cautious and wary. When the speculator arrived at Colombo he was told that the accounts he had seen were not correct now; that as the most advantageous tracts of land had been bought up he must purchase accessible forest at four times what it had cost speculators, or go back to the remote hills; besides labour had obeyed the law which regulates all prices and risen from 4d per day to 7½d, gratuitous pay for Sunday being given to those coolies who worked every day of the previous week. This alteration of prospects might damp the over-sanguine and may have saved some, but to the calculating it only appeared that " things were finding their level."

The magnitude of the " Coffee Mania" and the rapidity with which it spread may be judged of from the following figures. The quantity of hill forest available for the cultivation of coffee, sold by the Government up to October 1846 (since which scarcely any land has been sold) was 287,360 acres. Previous to January 1841 very little land had been disposed of. Of this vast tract of private property, we find by official returns that on the 31st December 1847 there were 50,070¾ acres cultivated, of which 25,198¼ were planted previous to the 31st December 1844 and the remaining 24,872½ in the three following years. The gross cost of this is said to have amounted to the enormous sum of £5,000,000 sterling.

The following is a comparative statement of the export of coffee from Ceylon for 14 years, ending 1849: it must be borne in mind that nearly the whole of what was shipped prior to 1842 was native grown.

In 1836 there were exported 60,329 cwts of coffee from the ports of Ceylon.

1837	„	43,164	„
1838	„	49,541	„
1839	„	41,863	„
1840	„	63,162	„
1841	„	80,584	„
1842	„	119,805	„
1843	„	94,847	„
1844	„	133,957	„
1845	„	178,603	„
1846	„	173,862	„
1847	„	293,220	„
1848	„	279,715	„
1849	„	373,368	„

When planting first came in vogue, the Kandyans flocked in hundreds to the great distribution of rupees, but this source of labour was soon found to be insufficient and of too precarious a nature to be relied on, even had there been a superabundance. The Kandyan was able to live on the produce of his rice fields &c. &c., before European capital was introduced and he has such a reverence for his patrimonial lands, that were his gain to be quadrupled, he would not abandon their culture; it was only therefore during a portion of the year that he could be induced, even by the new stimulus, money, to exert himself. Besides, working for hire is repulsive to their national feelings, and is looked upon as almost slavery. The being obliged to obey orders, and to do just what they are commanded in galling to them.

Next came the Lowlanders (Singhalese from the maritime provinces) who have a stronger love of gain, a liking for arrack and rooted propensity to gamble. In 1841, 1842 and 1843, thousands of these people were employed on estates: they generally left their homes for six months at a time and then returned with their savings, some to spend their hours in indolence and their earnings in debauchery, others to lay up their gains and profit by the profligacy of their neighbours; after a few months leisure they revisited the estates. The sudden access of wealth amongst them soon engendered as much independence and far more insolence than were to be found in the Kandyans: this source of labour which had at first poured forth so many thousands of useful members of society, became dried up, and the Lowlanders were only known in the central province, as domestics, artificers, traders and carters.

Southern India stepped forward to fill up the vacancy occasioned by the cessation from labour of the sons of the soil. So early as 1835, Tamil coolies had begun to immigrate into Ceylon.

It would appear that for some years, whilst wages were low and no great demand for their services existed, Malabars, as Tamils are indiscriminately called, must have come over with the intention of settling, or at least of being a long time absent from their country; as the proportion of women and children was much greater than afterwards.

Looking at the annexed table, we find the greatest number of coolies that arrived in one year, was in 1844, which may be accounted for thus: before the end of 1843 the Kandyans had ceased to afford a source of labour, the Lowlanders were becoming independent and not to be relied on, the "Mania" was raging at its height, and in the three previous years the departures of Indians had exceeded the arrivals by 14,823 souls.

Return of Arrivals at and Departures from the ports of Ceylon of Tamil Coolies, from 1841 *to* 1848.

Years.	ARRIVALS.			DEPARTURES.		
	Men.	Women.	Children.	Men.	Women.	Children.
1841	4,523	363	164	4,243	274	117
1842	9,025	279	166	10,691	345	228
1843	6,298	162	248	18,977	694	482
1844	74,840	1,181	724	38,337	825	535
1845	72,526	698	177	24,623	145	36
1846	41,862	330	125	13,833	48	23
1847	44,085	1,638	417	5,897	79	33
1848	12,308	504	229	12,749	229	65

During the years 1841 to 1846 the Tamil labourers must have saved or remitted to their country from £385,000 to £400,000: whilst the value of rice imported into Ceylon during the same period, chiefly from the Malabar and Coromandel Coasts, was valued at £2,116,189.

But against this pecuniary advantage, a great loss of life is to be placed, for during the eight years above enumerated, not less than 70,000 Malabar coolies are believed to have died in Ceylon. The planters have been most unjustly accused of aiding disease by neglect and harsh treatment. Such was not the case: I may safely say that medicines and professional attendance on the labourers, form no inconsiderable item in the accounts of almost every estate, not to speak of the indulgencies, pay and attention bestowed on the sick. The Tamils leave their homes to make a little money and to return as soon as possible; when they arrive on estates they are fatigued by a long journey, performed under great privations, the rice they bring with them is barely enough to support life until they reach Kandy, the road they traverse from the coast to the mountain capital is notoriously insalubrious, the water on it is scanty and bad, and during the period alluded to, there were no houses to protect the way-farer from rain or perhaps more baneful dews. Thus fatigued and ematiated, they begin their labour either with the seeds of fever in their constitutions or at least predisposed to disease; in place of living well and renovating their strength, they hunger themselves and exist upon the veriest trash and carrion, in order to lay by the more of their earnings, thus defrauding their employers and committing *felo de se* at the same time. There are a few men on most of the old estates who have lived in the same febrile atmosphere for years, but they feed well and have very slight attacks. The Tamils were vastly over-paid for their work and their master did not get value for his money, but until some higher motive than that which now actuates the Singhalese, shall stimulate them to labour for reasonable remuneration, the Indians will continue to obtain the same price for their feeble exertions. It is a disgrace and reproach to the people of the soil, that they pass the day in indolence and sloth, whilst strangers are cultivating their land, and amassing and carrying off the riches which they have only to stretch forth their hands and arrest.

The chief causes why coffee planting failed to be remunerative are traceable to two sources,—those who embarked in the speculation and the government. Want of knowledge and forethought on the one hand and culpable apathy on the other, are the prominent features which now appear to have led to the disastrous results. The knowledge which the former lacked was both local and general; they knew little or nothing of the country and less of the sources of industry and in too many instances a lamentable ignorance of the value of money was displayed, thousands of pounds being laid out, where there never should have been any hope of seeing it return. In some districts estates were formed on the most villainous land, disintegrated quartz rock with a little black mould on the surface, which as soon as the plants were put in, was washed away by the first thunderstorm.

Spem gregis, Ah! silice in nuda* * * * * * reliquit.

Others were so much exposed, that the violent winds destroyed in a few days, the growth of the previous nine or ten months.

The price of labour was raised to 18s 9d per month, for which there were only 25 working days, equalling 9d each, a rate at which coffee planting cannot be profitable, considering the small amount of toil done by the Tamil and the high cost of transporting produce 100 miles by land. Then again, though so highly paid, the coolies were not made to do more than two-thirds of what they could have done if forced to exert themselves; for some planters were negligent in looking after them, whilst others allowed them to do much as they liked in order to give the estate a good name on the coast. Now this was great injustice to their neighbours, because the man who would have a *quid* for his *quo*, got a bad name and the Malabars would not serve him, or if they did for a short period, generally absconded at his busiest time, when he had the most need of them. There was too little unanimity, too much selfishness, and too great anxiety to outdo all others, none of that hand in hand affection which ought to bind Britons to one another in distant colonies. If any of the disjointed members of the coffee community of 1844 read these pages they will admit the truth of my assertions.

The early estimates and accounts led us to believe that the average cost for cultivation, up keeping, and housing crop during the first five years would be little over £10 per acre; practice has however proved that £100 have been, on an average, expended during that period, and with what result? In place of having properties worth thousands of pounds, many estates which cost from £5,000 upwards have been abandoned as perfectly valueless, whilst others have been disposed of for one-fifth of the amount expended on them.

The government was expected to have opened up the country with roads, and purchasers of land, in many districts, bought it under the belief that such would be the case, but they were not aware that to promise and to perform are very different things. Whether a prospect of advantage be held out in sincerity or in bad faith, when it suits the diplomatist or man of the world not to perform his vows there are generally found to be holes to creep out at, and the claptrap of expediency and practicability are put in requisition. It will be well for mankind when these two words are only found in the dictionary as obsolete terms, which shall have been replaced by sincerity.

It is true that large sums of money were granted by the local legislature for keeping up and improving old roads, and no small amount was also voted for new lines, but it was not judiciously expended. There is no individual blame to be attached, on this account, to the very praiseworthy officer who was then commissioner of roads, his hands were bound by the general bad system of not making labourers do their duty, and he could not get value for the money he was empowered to expend.

The Ambegamoa road, which was to connect the southern coffee districts with the highest navigable point of the Kalaney-ganga, a most desirable undertaking and feasable in theory and on paper, was begun in or prior to 1842 and was not completed a few months since, though the distance is only 41 miles. It was a pet project of the government and the engineering difficulties were small. A great "Trunk line" was commenced (at the end of 1842) at Peradenia and was to have led to some place or other, opening up the coffee estates of Hantana, Nilamby, Delltotte and Hewechetty, the thickly peopled Corle of Maturatta, and the rich Ratemahatmaite of Wallapana with its fifty fertile valleys, but after costing the colony thousands of pounds, it appeared to hide its head in the forest and die, and its course beyond the first half dozen miles would be as difficult to trace as that of the Niger or Amazon. All that was done for Lower Dumbera was to build an expensive bridge over a small stream, where it was little needed, and to lay a heavy toll on it.

But on the main route from the coast to Kandy, the road by which labour, the mainspring of the island's prosperity, is admitted, not even an attempt was made to facilitate the Tamil's ingress and to preserve his health. This route passes through a part of the country almost uninhabited, where the water is bad, the air impregnated with miasm and the face of the country covered by jungle, filled with wild beasts. If we look on the Malabar cooly as a fellow creature he surely deserves our sympathies under trouble and difficulties; and without reference to his disposition, nature impels us to help him. If we view him in a merely mercenary light, it is the duty of the government and his employer to protect and assist him, for though he comes with the selfish motive of earning all he can and taking as much as possible out of the country, yet the obligation is mutual and he could better do without the government and the planter than they without him.

Not only had the owners of estates a right to expect, if not to compel, the ruling powers to facilitate the communication between the interior and that part of the coast where immigrants land in the greatest numbers, and to afford them protection against weather, man and beast, for they had paid into the Treasury not less than £71,840 for their land, but the coolies themselves had a strong claim on the government, on the broad principle of "what have you done for our money." A heavy customs duty (7d per bushel) is levied on rice, and by a return before me I find that from 1841 to 1848 inclusive, there were imported into Ceylon 14,052,865 bushels of rice, by which the Colonial Exchequer received £409,960. Of this sum, I consider that fully one-third was paid by individuals living in the Kandyan country. However to be within the narrowest limits, I will suppose that during the above period 245,000 continental labourers entered the province and by remaining an average of six months, each contributed 3s to the rice revenue, we have thus an amount of £36,750 for which the local government made no direct return. All that was required would have been to cut down the jungle from the path, to dig wells and erect thatched houses, at a very trifling expence, at convenient stations eight or ten miles asunder and to keep up free ferries over the river and smaller streams in the wet season, but the immigrants have met with the least possible consideration, being obliged to sleep in the rain and dew, on the wet earth, exposed to the inclemency of the elements, the mercy of wild beasts and the extortions of their fellow man. If one of a party fell ill or lame he could not be carried on by the rest,—not so much from their want of physical as of moral strength and he was left to die. Many a bleached skull lies by the wayside, the only monument, the sole unrecognisable memento of a body which contained an immortal soul.

The government did not maintain a rural police to protect standing crops and to terrify the coolies, who seldom went to the neighbouring arrack shop without a few handsful of coffee, but on the contrary filled the country with spirit "Taverns" where the true *gibier de potence* always congregate. Nor was there any check on the public carters who conveyed the produce to the shipping port; these men could with impunity take a portion out of each bag and supply the deficiency of weight by watering the rest, thus not only thieving a part of what was entrusted to them but damaging the remainder. The manner in which this is performed is very simple; the coffee being extremely dry and having a strong natural affinity for moisture, porous vessels filled with water are disposed amongst the bags, and the damage is done by evaporation and absorption.

The life of a planter is lonely, monotonous and unintellectual. If he be determined to do his duty to the proprietor (whether himself or another owns the land) he must be contented to renounce society, to withdraw from frequent intercourse with his countrymen and almost to give up the recluse's greatest resource, reading. He must rise before day-light and hurry to the coolies huts, to endeavour to get them on the work field before sunrise, he must stand over and watch that they do not skulk their work, in rain or blazing heat, until 10 A. M.; he has then generally a mile to walk home to breakfast, which having swallowed he must see what the artificers have done during the morning. At noon he is again with the labourers and drives them until half-past five, when he returns to his house, worn out in body and harrassed in mind by the annoyances and laziness of all around him. By the time he has refreshed himself with soap and water his dinner is served, after which he may nod, half an hour, over a newspaper, and lays down his weary limbs for the night at half-past seven. Sunday is the only day he has to hold intercourse with his neighbours, to shave himself and arrange his private affairs.

Such a life is bad enough in fine weather, with plenty of clean clothes and food in the house, but is perfectly disgusting in the wet season. At such times there is a good deal of work to be done, such as planting out young trees, weeding and often gathering the ripe fruit. The novice begins by putting on a dry suit of clothes when he comes in to breakfast, and ditto repeated in the evening, until he finds that he has none left and the only resource is to put his one dry suit on whenever he is in the house and change into his wet ones when he goes out again. How little do poor anxious mothers, snug by their sea coal fires, think what their dear boys are suffering in the land of "sunshine and perpetual verdure" or how they enjoy the luxury of a smoke-dried shirt.

Oriental splendour, magnificence and ease are very fine things in a theatrical tableau; but such scenes can only be got up by the aid of tinsel, cut glass and the foot-lights.

Things are never considered to have reached a climax until the commissariat fails. The fowls die of the pip, the bread turns blue, red, yellow, in short all the colours of the rainbow, the sugar takes the aqueous infection and dissolves, as does the salt; the potatoes and onions sprout, the rice gets musty, the boy makes two cakes for himself and one for master out of the cask of flour, the "prime York ham," a jungle man's sheet-anchor, disappears mysteriously; the rats have eat the candles and the oil tin leaks; the cheroots are like damp brown paper and wont smoke and the last bottle of whiskey was finished two days ago by the cook who had a stomach ache. It is generally received as an axiom that when things have got to the worst they must mend, but such is not the case in Ceylon, they remain at the worst for a long time. It is no use sending or going to your neighbours in your difficulties for they are as ill off as yourself, the villagers know you must have their provisions and dole them out with a sparing hand at exorbitant prices. Being surrounded by roaring torrents, which cannot be passed for days and sometimes weeks, no supplies can be got from the towns. The temper becomes soured by seclusion and the mind harrassed by constant disappointments and the misconduct of others. The life of a planter is very abrasive of the external enamel of a man's character; excluded almost entirely from the refining influence of ladies' society, the polish wears off his mind, though the substance may remain as sterling as ever. Passing much of his time alone, for a man must feel very solitary with none but weak minded coolies to talk to, he dwells on his position, on his own affairs and becomes selfish. The planter is negligent of his personal appearance and generally has his house in great disorder. Hospitality however is one of the kindly feelings most strongly developed in the class I am speaking of, and in a country like Ceylon it is a peculiarly amiable feature in the social character. The invalid or wayfarer, however unexpected his arrival, or how little soever he may have been acquainted with the brother planter, under whose roof he seeks change of air and scene, nay even perfect strangers, are sure to find a hearty welcome.

I shall now give some account of the cultivation of the Coffee plant; and begin in the old matter of fact style by stating that it is botanically called "Jasminum Arabicum" from its being of the Jasmine family and indiginous to "Araby the blessed." Its introduction to Ceylon must be of considerable antiquity, it having most probably been brought from the Red Sea direct at a very remote period. The young plant is a pretty shrub, the branches grow in pairs, alternately, those near the root extending the furthest from the stem and the others gradually shortening to the top, give a pyrimipal appearance, the leaves are large and of a rich, deep green.

In offering the following remarks on this very important branch of tropical agriculture, I wish to point out what appears to me (after many years of practical attention to the subject) the best plan to follow in Ceylon. It must therefore be borne in mind that I do not write of cultivation generally but locally; nevertheless, I think that some parts of the Ceylon *modus operandi* may be introduced into other colonies with advantage.

In this culture, the first care is the selection of locality. This is of such paramount importance that if a material error be committed in choosing the land, all future economy, care and exertion will be but thrown away. The great requirements are elevation, shelter from wind, quality of soil and proximity to a cart road.

The coffee plant will grow and reproduce itself on a level with the sea, and at 2,000 feet above it the trees, whilst young, will have the most luxuriant appearance, come soonest into bearing and yield the greatest measurement quantity per acre, but the bean is light and of an inferior quality. At and a little below this height are extensive tracts of the richest land but they are subject to long and frequent droughts, the crops are in some seasons scarcely worth collecting and plantations formed in such lands must soon fall off. This has been demonstrated on the plains of Doombera, where most of the estates have become comparatively worn out in eight or nine years.

The best properties are situated on the mountains, where rain is frequent and the temperative moderate. The soil is not generally quite so rich as in the valleys, but the forest being heavy and the fallen timber decaying gradually, a small though constant return is made to the land, whereas the trees cut down on low gardens are carried to the towns for firewood and other purposes.

The aromatic properties (and consequently fine flavor) of the coffee plant are best developed between 3,000 feet and 5,000 feet above the ocean. The higher it is cultivated with care, below frost, the better will be the quality of the produce. A mild climate and rarified air are highly favourable to coffee, both of which are given by elevation. The cool climate of the Kandyan hills is equally invigorating to the planter and his shrubs, both luxuriating in a temperature of from 55° to 60°, night and morning, whilst the thermometer rarely rises above 73° at noon.

In the elevations above 4,000 feet the trees do not yield a maiden crop until three years after planting out, and at four years old they are in full bearing. The wood taking long to grow is hard and firm before nature calls on it to support fruit, and it is reasonable to expect that it will remain longer in full vigour than a plant which is forced by the heat of lower situations into a rapid growth and speedy fructification, and which perverts the application of nourishment from the completion of its own body to the precocious reproduction of its species.

The appearance of "high mountain beans", is long, blue, the longitudinal seam curved, with its sides close and compact; its specific gravity is greater and its aromatic principle more abundant and finer than that produced on low lands, which I attribute to its being grown slowly in a cold climate. Though the quality on the hills is superior, the quantity is less. Seven cwts per acre is calculated upon, whilst 10 cwts is the average from low lands, though it is said that one of the Hunesgiria estates once returned 18 cwts per acre.

I do not think that the difference of cost when laid down in Kandy between a 50s and an 80s (London prices) coffee exceeds the ratio of 2 to 3, and in most instances the proportion is lower; on the latter, the weight of the produce of one acre being less, the cost of land carriage, freight, Colombo and London charges &c. &c., are proportionably lower and the profit higher. But there are other and more cogent reasons for preferring the hills; amongst the rest, coffee is one of those articles of which, though the inferior qualities may be unsaleable in Europe, a superior sample will always meet with purchasers about its real value, as it is consumed by a class who *will* have it and who consequently *must* pay for it,—it is a luxury. This was clearly shown in 1847 and 1848, when although "Ceylon plantation" was sold from 35s to 50s per cwt as a general price, a few samples from the highest estates brought 85s and 92s.

In selecting land, it is better to choose an easterly or northern aspect, for though the morning sun falling on the dew is said to injure the plant, and the setting sun to improve its fruit, the advantage of shelter outweighs these considerations. Where land lying to the S. W. has to be opened, the manager will do well to take advantage of the natural facilities offered by the undulation of the surface, and form fields so as to avail himself of the protection afforded by rising ground with a belt of forest trees on its summit to windward, and such fields should vary from 2 to 10 acres in extent.

The south-west monsoon not only blows with great fury in the hill region of Ceylon, but appears to exercise a blighting influence and to curl up and wither the few leaves it does not beat off the trees. After a strong gale, a field of coffee exposed either to its direct influence or to an eddy wind, which is if possible more baneful, will be found in a great measure denuded of its leaves, the berries beaten off and the bark of the trees seriously injured round the part of the trunk where it strikes through the earth. When this is the case the best plan is to drive three stakes into the ground round the tree, and tie it tightly in such a manner that the friction and consequent excoriation may at least be avoided, cut the plant down to *two* feet and propagate the plantain tree for shelter. Under this management the shrubs spreading laterally will soon interlace their branches, render mutual support to each other, cover the ground and so acquire strength enough resist the force of the wind in a great measure and then the plantains may be eradicated, and the land if tenacious will have been improved by their growth.

The best soil is of a deep chocolate colour, friable and abounding with blocks and small pieces of stone, which in the rainy season prevent the excessive washing away of the mould, and by their obstructing evaporation in the dry weather, afford refreshing coolness and moisture to the roots of the plants; such patches of land are generally found at the bottom of the escarpements of the hills, or in elevated valleys and rarely on the slopes. Quartzose land, of which there is much, must be carefully avoided and clay is equally bad. I have seen quartz land, which looked more like sugar-candy than anything else, planted and grow tolerable trees for a year or two, but they could never screw themselves up to the fructiferous point. There is a black earth too, which has deceived some people, it has the appearance of fine rich garden mould but is in fact disintegrated quartz and mica, not having any of the good felspathic components in it. It is of no use planting in a good surface soil unless it have at least two feet depth, as the coffee tree has a long tap root.

The first work is to prepare a nursery, which must be proportioned to the extent of land to be cultivated; and situated with regard to proximity to the intended fields. The forest having been cut down, the branches and logs are rolled on one side and the earth dug up a foot deep, all the roots and stones being carefully removed; it is then laid out in beds, six feet wide, with trenches between, which serve the double duty of drains and paths. Good seed having been procured, the grains are sown six inches asunder; if the land becomes parched, it will be well to shade it with green branches and irrigate it night and morning; should a long continuance of rain follow sowing, the seed sometimes decays in the ground. It requires from six weeks to three months, according to moisture and warmth, before it germinates and in four months more the seedlings are ready to be transplanted.

On opening an estate, the manager must look for his best soil and fell the forest in patches of not more than 30 acres in area. Some plantations have fields of two or three hundred acres and I believe in one instance there are one thousand acres in one clearing, but that is, to say the least, a very hazardous plan, for on such properties it is not a rare occurrence to see several acres together blasted by the wind and either permitted to run to jungle again, or dragging on a blighted, sickly existence at an enormous and profitless outlay of capital. But such are generally old properties, and to the individuals who formed them, little if any blame can be attributed; they acted to the best of their judgments but lacked local knowledge. Many of those who now boast of their better management are but profiting by the dear bought experience of others.

When the forest is felled the small branches must be lopped off and the larger ones thrown on them, which expedites the drying of the wood. Should there not be rain the timber may be set fire to in a month, but as showers are frequent, it is generally ten weeks before it is sufficiently dry for burning. After a good running fire, very little has to be piled in heaps and consumed, as making neat work is a useless expence, baking the land destroys a great portion of its most valuable vegetable component parts and the timber when left to decay forms excellent manure. I should recommend that the smaller branches which are not consumed, should be cut up and laid as much out of the way of the plants and movements of the labourers as possible, but not burned. For the information of those who have not seen a coffee garden I may observe that it bears no resemblance to an European garden. The land is generally a steep hill side with undulating surface, huge rocks protruding their crowns and enormous blocks of stone studding the whole extent. Blackened trunks of trees with their branches sprawling in all directions give the field the appearance of having once been the site of a town which is now laid in ashes,—a confused heap of calcined stones and charred rafters. When cleared the ground is marked out by a line and pegs, in squares of six feet every way, and at each peg a hole 18 inches cube is dug. These are filled up with surface soil, and when rain sets in the seedlings are transplanted from the nursery to them. This would give 1,210 trees per acre, but owing to rocks, streams and paths, where plants cannot grow, the average is 1,100 per acre. There is difference of opinion as to the distance trees should be apart from each other; from my experiments and observation I am of opinion that six feet is the best,—if they are further off, they will not cover the ground, in which case both land is lost and the weeds grow more easily,—if they are closer than six feet the plants are subject to breakage and injury, as their branches lock into each other and obstruct the workman's passage.

From the time of planting, the fields must be kept free from weeds, which may be done at a light expence, if care be taken never to allow them to seed. Where swamps are found in a field, I should recommend their being drained as much as practicable and planted with guinea-grass or lemon-grass, either of which will soon cover the ground, prevent weeds growing and spreading their seed, besides it is turning the land to account, for the former grass is excellent forage for horses and cattle whilst the latter is the herb most used for thatching buildings, and even if there is a superabundance it would be profitable to cut it for manure. The most troublesome weeds on the hills are the Spanish-needle, Sow Thistle and Elk-plant. Ferns are also numerous. The Spanish-needle seeds in five weeks and multiplies itself at least two hundred fold each seeding, so the reader may easily imagine the necessity for taking these noxious plants out in time. The low estates are subject to all these and several grasses, besides wild spinage, and worst of all, Iluk-grass, which is of the Andropagon family, I believe Andropagon Caricosum;—if it once gets fairly rooted the expence of eradication is enormous. Weeding should be done by the hand and on no account with the hoe; the sloping surface affords sufficient facility by its steepness for the deluging torrents of rain to wash away the richest ingredients of the land, without its being unnecessarily loosened. Hoeing is only excusable when weeds have been suffered to flower, when they may be cut down to prevent their increase, but hand work must soon follow as the roots have been strengthened by having the stalks cut off, gain a firmer hold of the soil and will shoot up more vigorous stems.

The coffee tree, if allowed, attains 15 feet in height, but in Ceylon plantations they are all kept down to 3 or 3½ feet above the ground. This makes the shrub shoot out laterally and produce at least 25 per cent more than it would do if permitted to attain its natural height and to occupy more land. In topping care must be taken to cut off the uppermost pair of branches, as their weight when in fruit would split the head of the stem. Nature is constantly throwing out young shoots which try to grow upwards but they must be carefully broken off as they are a great and useless drain on the juices of the plant. Never cut a sucker or branch off a tree when you do not wish another to come, but always break it.

From flowering to harvest is from 8 to 9 months. A field in full bloom is a beautiful sight, the clusters of white blossom contrast prettily with the deep green leaves and the whole at a distance looks as if it had been snowed on. The flower only lasts one day. If the atmosphere be dry the bloom is sometimes lost as it will not set without moisture; mists and light drizzling rains are the most favourable weather at this time. The fruit grows on a foot stalk of half an inch, in clusters round the joints of the lateral branches, and when of full size, but still green, resembles small olives. A mouth before ripening it turns yellow and through different shades to ruby red, when it is ripe and from its likeness to our European fruit is technically called "cherry." During the latter part of its growth, particularly, it requires a great deal of moisture, otherwise the bean will be shrivelled, not perfectly formed, light and of inferior quality. The climate of the hills is most beneficial when the fruit is filling and just before it ripens.

I have described what "cherry" is, we will now open it and find that it contains "pulp", in which are two seeds They are covered by a viscous substance called "gum", an integument known as the "parchment" from its resemblance when dried to that animal product, and a pellicle named the "silver", which is very like gold beater's skin, and the grains of coffee which are styled "beans." Sometimes there is only one bean in a cherry which takes a more rounded form and is called "peaberry." This is caused by only one of two embryios coming to maturity, whilst the other is abortive, the rudimentary form of which is always apparent.

When the fruit becomes blood red it is perfectly ripe and should be gathered. To the height of 3,000 feet the chief crop ripens in October and November, and a small second gathering is looked for in May. In the course of a few days the cherry passes from yellow to blood red and a great number of coolies must then be employed—for once ripe the sooner it is plucked the better. On very high plantations, though the heaviest gatherings are in June and December, some fruit is arriving at maturity almost all the year round; blossom, green and red berries may frequently be seen on the same tree. This gives more trouble to the superintendent, but is better for the proprietor, who is not obliged to engage a large force of labourers when every one else wants them and when the Malabar knows his own value. When the crop extends over eight months of the year, the facilities for curing it are much greater and cost of transport lighter.

When the quantity of coffee is small it is usually dried as plucked from the tree and the flavour is found superior to that which has been divested of its pulpy covering. But when the plantation is in full bearing the extent of drying ground required, the length of time and the labour of moving so vast a weight, preclude the practicability of this plan. A pulping house must then be built, it should have a loft to receive the cherry and from which the machines are fed, a pulping room below, where the mills are stationed, with a tank underneath. This building is all open, walls not being required.

The "pulper" is an oblong frame on four legs, furnished with a cylinder covered with copper which has been perforated by a triangular punch, from the side laid on the wood, leaving three pointed asperities on the outside, like a nutmeg grater. In front of the grater is an iron bar or "chop", at a distance regulated according to the size of the bean, and a lower chop so nearly touching the copper that a sheet of letter paper may just pass through. A rotary motion being given to the cylinder, the hopper above it being supplied with berries and a constant stream of water kept up, the teeth of the copper draw the berries against the chop and there not being space enough for them to pass between it and the cylinder, the pulp is torn off, carried between the lower chop and the barrel and passed away behind, whilst the beans are thrown out in front on a sieve, under the machine. The pulped coffee falls into a cistern below and the "passed cherries," with a few stray husks, are returned to the hopper.

The coffee is next thrown up together and allowed to remain heaped, until the gum is sufficiently fermented to be washed off, which is known by its feeling rough in the hand; this will take from 12 to 36 hours according to the quantity heaped together and the temperature of the air—great care must be taken not to overheat it. Coolies must then dance amongst it for half an hour and a stream of clean water being let in and the coffee agitated by rakes or machinery, all the gum and dirt will soon be carried away. The beans which rise to the surface of the water, being inferior and imperfect, must be floated off into another reservoir and dried separately. The store or warehouse may be constructed of any shape and materials, which circumstances or fancy dictate. It may be built of brick or timber and covered with tiles, felt or corrugated iron, but the most economical stores have the walls of jungle sticks and clay, are thatched with lemon-grass and have a loft or second floor in the slope of the roof,—they are erected at a light expence and answer every purpose. On some estates the pulping mills are turned by a water wheel, which is a great saving of labour at the time when it is most in demand, but on the high hills, the cost of transporting heavy iron work is so great, the wages of good artificers so high, and the difficulty and delay in repairing any accidental damage so retarding to other operations, that hand work is likely always to predominate.

Drying platforms, like the barbacues of the West Indies, are not uncommon, especially amongst old estates; they are constructed of broken stones pounded together and glazed with a composition of mortar, fine sand, palm sugar (that from the palmyra being preferred) and bark juice, but as the cost is heavy many planters prefer giving the ground a slope of 1 in 20—claying it and spreading matting to receive the coffee. Perhaps the best contrivance is a a set of trays on wheels, fitting into a shed, one under the other, and which can be run in and out, on a tram way, as the weather suits.

If coffee gets two days sun after washing, there is not much fear of its being injured by being kept long in store; indeed at this stage it is advisable not to expose it to the direct influence of the sun for nine or ten days, as the gradual drying causes the *silver* to separate itself from the bean and to hang on it like a bag. Coffee slowly dried will be easily divested of all the *silver*, as just stated, and a clean sample insured, but however ripe the cherry may have been when gathered, if the bean is hardened quickly, a portion of the pellicle will adhere, leaving a dirty sample and the impression on the buyer that it had been plucked half ripe. I consider too, that the quality of the article is improved by slow drying, or more properly speaking that less of the aromatic principle is evolved. During rain, which is generally very abundant at fruit time, the wet coffee must be spread under cover and constantly turned to prevent its heating, and even that which is partially dried should be worked over twice a day, as a very little moisture in a large heap soon causes germination to commence and gives to one end of the bean that peculiar red tinge, known as "foxy" in the London market.

Produce must be hard dried, until the grains resist the nail and are quite horny, before it is despatched to Colombo, but in the *parc'ment;* the protection against moisture which this shell affords, more than counterbalances the cost of its transport. After its arrival in the seaport no time should be lost in cleaning and shipping it. Having been sunned, it is put in a circular trough and a heavy wooden wheel passed over it, until all the husks are broken; it is then fanned and agitated in a perforated cylinder, through which the small beans and broken pieces fall.

It must be packed in well-seasoned casks and shipped immediately, for if exposed to the saline damp, with which the atmosphere of a tropical shipping port is generally charged, it will soon attract so great a quantity of moisture as to turn flexible and bleach;—there are few simple vegetable products, dies excepted, which owe so much to their colour as coffee does.

It is only a few years since capitalists began to turn their attention to the agricultural resources of the Kandyan country and yet the export of plantation coffee from the island during the year ending 10th October 1850 was more than 235,000 cwts. The spur given to the villagers may be seen by comparing the last year's native export of 125,000 cwts with the total shipments in the years 1836 to 1841 as given in the early part of this notice.

The first adventurers naturally selected their lands near a government road and hill estates were not so much as dreamt of, until all the available low lands were bought up. In one instance the enterprizing but unfortunate proprietors believing it necessary to till the ground, went to work at a great expence, removed all the roots and ploughed up the land, but the result was a signal failure. Others left the largest forest trees standing for shade, but that has also been found injurious.

Ceylon is peculiarly adapted to the growth of coffee, and very good land may be found with a little care in selection. Being a mountainous island, with three sides open to a vast expanse of ocean, drought is little known, even in the dryest seasons the hills attract clouds, which frequently pour down refreshing showers. The heavy mists and dense clouds which sometimes shut out the sun for days together, or roll sluggishly along the mountain sides, are amongst the planters best auxiliaries. The shrub luxuriates in a rarified, temperate and moist climate, and delights in frequent but not heavy rains on the slopes, where there is a good natural drainage —for any lodgement of water about its roots soon proves fatal.

Want of facilities for manuring, the attacks of vermin, the absence of a working population and state of the roads are amongst the greatest drawbacks.

One great error into which speculators fell, and in which we must now confess we showed childish ignorance, was to expect that the land was so rich as to be able to keep the plants up to one uniform point of fruitfulness for fifteen or twenty years without manure. It requires no knowledge of chemical agriculture, but only calm, unbiassed reflection to convince us that the richest mould cannot yield crop after crop for years, unless a proportionate return be made to it; to say that it can, would indeed be giving inorganic matter a self-germinating principle. Many have tried decayed coffee pulp as a renovator, under the impression that by so doing they were placing in the ground what they wished to draw from it, but practice has too fully exploded the theory to leave any necessity for explaining its failing on scientific principles. At the sametime, it is equally certain that the coffee pulp in combination with other vegetable, animal and mineral matter may form a valuable renovator of the soil. The skill of the chemist may be very advantageously brought to bear on this subject: he finds that the plant and its fruit are differently composed, he knows that it is more necessary to provide for the fruit than the stem which supports it; he finds that a large proportion of the analytical composition of the bean is nitrogen, which his science teaches him may be produced by certain phosphates &c., under particular circumstances; the knowledge accumulated by his own and other men's researches point out at once where these salts and gasses may be found and he works on a certainty. He can in a few days and at trifling cost produce what the uninitiated may spend a life time and a fortune over without attaining. It is pitiable to see the manner in which the most soluble and the best portions of the soil are washed away by the rains; this is a subject which equally deserves the attention of the planter, with the manuring question.

There is an animal known as the " rat," which does much mischief by gnawing off the young branches, apparently to get at the tender pith; it is called " Daddawedda" by the Singhalese, is as large as a weasel and of a greyish-black colour.

Monkeys, squirrels and the Daddawedda commit great depredations in fruit time; they are partial to the sweet pulp which they digest but evacuate the beans whole.

The devastation caused by the Coccus insects, commonly called the " bug" is lamentable in the extreme; a tree attacked by this pest has the appearance of having had a bag of soot shaken over it, the leaves and much of the green fruit fall off and the plant is long ere its recovers its vigour.

Transport is a heavy item from the estate to Kandy. The produce is generally carried the greatest part of the way on pack bullocks, and from thence to Colombo carthire frequently rises to 2s 3d per cwt for coffee in the parchment. It is almost impossible for hill planters to work their own cattle, as the native drivers neglect them and often use them to their own profit, so the transit is generally effected by contracting with a Moorman drover. Absentees urge on their representatives that they should keep plenty of cattle for home use, but they little know the difficulty of purchasing stock and the heretofore almost impossibility of keeping them. The grass land on the hills, produces an herb quite unfit for the food of neat cattle, the native takes no interest in the white man's stock and disease is prevalent amongst them.

Beyond the growth of coffee, the productive resources of the Kandyan country are very great, but who will develope them?

Nutmegs have been tried but with what result I know not, the only plantation of them was young and not in bearing when I left the colony and I have not seen any notice of it in the local papers. It is a very costly, hazardous and anxious culture—the plants require 10 or 12 years to attain their full vigour of bearing and what changes in prices and prospects may not occur in that time? It is one of the many plants peculiar to that rich and beautiful region, the Indian Archipelago, and how it may thrive and to what extent its spice producing powers may be weakened by naturalizing it in Ceylon, I know not.

Cloves will probably never be tried, for they are more tenacious of their Archipelagic home than even the nutmeg.

Though the cacao flourishes well in the Peradenia gardens, it should not be attempted as an article of extensive cultivation. Great humidity is favourable to its only when it augments gradually and continues a long time without interruption. Heavy, occasional showers are very injurious to it. When the fruit in the dry season is wetted by a heavy shower it drops off. The harvest is very uncertain, besides the trees do not bear under eight or ten years and it can be produced cheaper in its native country than in Asia. Castor seed might be profitably grown by the natives in the same manner they produce their coffee which requires little exertion beyond the gathering and conveying to town, and I do not see why the oil should not be made as cheaply and as good in Colombo as in Calcutta.

Fibrous plants are beginning to meet with a portion of that attention which they so richly merit, and a day may yet come when Ceylon shall export jute, sun-hemp, (a substance equal to Manila hemp), and cloths equal to the finest cambrics, manufactured from the leaves of the aloe and pine-apple. The cactus and mulberry thrive well but we can scarcely look for silk or cochineal.

There is a plant but little kown, yet by no means uncommon in the Kandyan province, which might be easily made to afford an article of export. I mean the cassava, which is the real jatropha malito or tapioca plant. It does not require much care, is ripe in 7 or 8 months and the farniacious substance contained in the roots is extracted by the simple process of scraping, washing and evaporation.

The very beautiful, peculiar and useful class of plants schitaminece might be very easily turned to good account;—there are extensive tracts of land now useless, which might be made to produce arrow-root, ginger, turmerick, and cardamoms in great abundance and of excellent quality. But to do all this neither labour nor manure must be spared. Such an undertaking could not repay a man of property and education. The labouring classes of Europeans cannot work in the tropics, at least at such elevations as the above mentioned plants thrive in. The natives are too wanting in energy to embark in these new speculations. The Indians are keen traders and not given to agriculture, or else persons who come over from the coast for limited periods to earn a few rupees and return. The Eurasians are not an agricultural class and probably never will be so.

The men who could be most advantageously introduced would be Chinese. They are a people of laborious, plodding, energetic and enterprizing character, with much greater physical strength than Indians or Singhalese and constitutions better adapted to exertion in a hot climate than Europeans; if kept under due restraint they would be the best colonists. There is no race who can turn land to better account by mere labour, unaided by science and advanced art.

Were a colony of 300 or 400 of them established in Doombera, for instance, on the present waste government lands, or on the old coffee estates, I doubt not that the most beneficial results would ensue. All that they want is a community of their countrymen and to be well supplied with such Chinese articles as they are used to. A small colony judiciously planted would cause a demand and consequent supply of those articles which are essentially necessary to make them comfortable, whilst they would furnish the Kandy and Colombo markets with merchandize at present scarcely known. If this first establishment succeeded, every season would reinforce their ranks with recruits from their native land. In addition to all their industrial habits and artistic acquirements, they have a great recommendation—that if they can make a living they will attach themselves to their adopted country. If they make fortunes they are even more bound to us, for whilst they and their property are under the protection of our laws, both are safe, whereas if they return to China both are in jeopardy. The Kandyans would intermarry with and bind them by closer ties than even the precious links of £ s. d., to the fertile isle. Their religions are in name, though not much in reality the same, and being a money-making race, able to keep women in slothful indolence and comfort, the celestials would be looked upon as eligible matches for the young girls of the neighbouring villages. I would not be misunderstood and supposed to advocate the introduction of Chinese as labourers for hire—as such they would never do any good. They must have an interest in the produce of their labour.

NOTICES OF PINANG.*

Chinese Coolies for the West Indies.

The recent visit to the Straits and China of Mr James White, as Commissioner for enquiring into this subject, with the view of inducing Chinese coolies to emigrate to the West Indies, will probably cause the following papers to be read with interest by some parties. It will be observed that these papers contain as full and complete information on the subject as could be collected by enquiries at the present time.

To the Hon'ble P. Dundas, Esquire,
Governor in Council,
Prince of Wales Island.

Hon'ble Sir,

We have the honor to acknowledge the receipt of your dispatches under date the 8th and 9th January 1806, detailing your proceedings with respect to the Chinese settlers who were engaged under the immediate orders of the late Lieut-Governor of Prince of Wales Island to accompany Mr Macqueen to Trinidad: the letters of the same date from the Secretary to the Governor at Prince of Wales Island, have also been submitted to us, and we have the satisfaction to express our approbation of the measures which you adopted for the purpose of giving effect to the project of conveying Chinese settlers to Trinidad.

2. The Chinese included in the agreement framed by you at Prince of Wales Island, having arrived at this presidency, were placed under the charge of Mr Macqueen and we immediately proceeded to engage a vessel for their conveyance to the place of their ultimate destination.

3. The ship Fortitude, which has been freighted for this service, will accordingly proceed to Trinidad in the course of a few days, with the Chinese from Prince of Wales Island, together with an additional number engaged by Mr Macqueen in Calcutta, amounting altogether to 200 persons.

4. Mr Macqueen will proceed to Trinidad in charge of the Chinese, and will bring back such of them as may choose to return from Trinidad, on the Fortitude, conformably to the provision of the agreement concluded at Prince of Wales Island.

5. Should the present experiment be found to succeed, it is probable that the plan will be greatly extended and it is proper that the Government in India should be prepared to aid Mr Macqueen in the further prosecution of the objects of his mission, after his return from Trinidad. The immediate superintendence of the further arrangements, cannot be committed with equal advantage to any other hands than those of the Government of Prince of Wales Island, and we accordingly request that you will

---

* Continued from p. 93.

be prepared to co-operate in this measure after Mr Macqueen's return, in the manner prescribed in the former instructions of the Governor General in Council to Mr Farquhar, of which you are already in possession, and under the same restrictions.

6. We have the honor to transmit for your information, copy of a paper submitted to the Governor General in Council by Mr Farquhar, which appears to us to contain much useful information on this subject, and we recommend it to your particular notice. We also deem it proper to communicate to you copies of other documents relating to this subject, which have come under our notice. A copy of the instructions from the Secret Committee is also annexed to this dispatch.

We have the honor to be,

Hon'ble Sir, &c. &c. &c.

Signed by the Governor General in Council.

Fort William, the 18th April 1806.

Enclosure in No 2.

The events which have recently happened at St. Domingo necessarily awaken all those apprehensions, which the establishment of a Negro Government in that island gave rise to some years ago, and render it indispensable that every practicable measure of precaution should be adopted to guard the British possessions in the West Indies, as well against any future indisposition of a power so constituted, as against the danger of a spirit of insurrection being excited among the Negroes in our colonies.

It is conceived that no measure would so effectually tend to provide security against this danger, as that of introducing a free race of cultivators into our islands, who from habits and feelings would be kept distinct from the Negroes, and who from interest would be inseperably attached to the European proprietors.

The Chinese people are represented to unite the qualities which constitute this double recommendation: accustomed to receive a portion of the produces of the soil they cultivate, as the recompense of their labour, they are inured to habits of industry, which by economy and perseverance are not uncommonly improved into the means of enabling them to become themselves proprietors.

This character of the Chinese has been supported by the various colonies which they have been accustomed to establish in the islands of Java, Manila, Sooloo, and within these few years under the Government of the India Company at Prince of Wales' Island, where a population of upwards of 14,000 Chinese are said to be at this time settled.

The disposition which this people have shewn to form establishments in all countries where incitements have been held out to their industry, renders it not impossible that under adequate encouragement, some of those who are now settled at Prince of

Wales Island, may be induced to extend their migration to Trinidad, and that by a well concerted plan, numbers of their countrymen may hereafter be led to establish in that island, and afterwards to spread themselves into our other colonies.

With a view towards the attainment of an end so desirable for the future security, as well as for the improvement of the British possessions in the West Indies, it is thought advisable that a person who from frequent intercourse with the Chinese settlers, has become conversant with their manners and customs, should proceed to Prince of Wales Island for the purpose of endeavouring, under the direction of the Company's Goverments, to prepare the way for carrying this measure into execution, and Mr Macqueen, who for several years was employed on the Naval station at Prince of Wales' Island, has in consequence been selected for this service.

It will be necessary that secret instructions should be sent to the Governor-General in India, directing that the officer in command at Prince of Wales Island, should be enjoined to give every facility in his power to Mr Macqueen, with the intent of his being enabled to engage as large a number of Chinese families as possible to accompany him to Trinidad.

Should Mr Macqueen succeed to any extent in this undertaking, so as to render it necessary that a ship should be taken up for the conveyance of these people, the Government of India should be instructed to provide him with whatever tonnage may be requisite, for the comfortable accommodation of them and their families, and to regulate the extent of this not only by a consideration of the length of the voyage, and of the novelty of the undertaking but by a due attention to the importance which is attached to the introduction of this industrious and useful class of settlers into the Island of Trinidad.

This object, which abstractedly must be considered as of great national concern, will derive a strong additional recommendation, when it shall be seen that the immediate interests of the India Company, and of our extensive empire in the East might be connected with the plan, to the advantage of our navigation, and to the improvement of the revenue of the United kingdom.

It is a well known fact that until the enterprizing people of the North American States were induced to open a direct intercourse of trade with India and with China, the manufactures and productions of those regions could be introduced into South America by only two channels, viz. the circuitous and highly chargeable one of Europe, or the tedious and scarcely less expensive one of the Phillipine Islands.

The speculation of the Americans was early directed to this valuable commerce, and the extent in which they have engaged in it, is made sufficiently manifest by the number of their ships that have of late years cleared out from the different ports of India as well as from that of Canton.

There cannot be a doubt but that the India Company might by a well directed intercourse of trade from India and China to Trinidad render that island a depôt for this commerce; that we might thereby be enabled to supply the continent of South America with the manufactures and productions of India and China, instead of leaving that source of wealth in the hands of the Americans; that the clandestine trade which they carry on to a great extent with the British West India islands in those articles might in a great measure be suppressed, and that specie, which is so essential in our China trade, might in this manner be collected upon the most favorable terms, and the India Company be thereby enabled to import their investments under very considerable advantage.

It will be necessary that the views of Government upon this subject should be communicated to the Secret Committee of the Supra-cargoes at Canton, and that they should be called upon to take into immediate consideration, how far it may be practicable to forward those views by any means which it may be in their power to adopt.

The facility with which the crews of European ships have frequently been recruited by Chinese seamen: and more especially the number of persons of that nation, who accompanied Captain Mears from Canton to Nootka Sound, with the intention of forming an establishment in that distant region, are circumstances which cannot have escaped the observation of the Supracargoes, and from which the strongest presumption may be drawn, that under their direction, and without any ostensible act which could give umbrage to the Chinese Government, measures might be taken for encouraging Chinese cultivators and mechanics to embark for Prince of Wales' Island, as a place of rendezvous, where they may be employed and taken care of until an opportunity should offer for conveying them to the island of Trinidad at the expense of Government.

(True copy)
(Signed) N. B. Edmonstone,
Secy. to Government.

Devonshire Street, December 18th, 1802.

Sir,

Since I had the honor of calling on you some time ago, I have occasionally consulted several works on the subject of China, in the hope of meeting with some fact or information, that might lead to a further confirmation of the opinion I had intended to offer you on the subject you then proposed to me, and which I was unwilling to bring forward without being supported by any higher authority than my own personal knowledge or experience. I have not however hitherto met with any writer on the Chinese empire who has professedly discussed that point or given us general information of the temper with which the Chinese Government has actually regarded the emigration of its inhabitants, or of the effect of those emigrations on the different countries in favor of which they had taken place.

The jealous policy of the Chinese Government, tending to exclude the natives as much as possible from any intercourse with strangers, is indeed generally remarked, and it is conceived to be the result of that disposition that the natives are prohibited from quitting their country, at the same time that foreigners are forbidden to introduce themselves into it. The latter is however permitted under certain restrictions, and the Vice Roy of Canton is actually authorized by the imperial sanction to select and send to Pekin such foreigners of talents and ingenuity, who may be disposed to devote themselves for life to the service of His Imperial Majesty. The Catholic Missionaries have availed themselves of this circumstance, through the medium of the Portuguese senate at Macao. Their residence is indeed confined to Pekin and its immediate vicinity, and all hope of returning from thence mostly precluded.

On the other hand, it would seem that although the Chinese Government will not countenance the embarkation of the natives on board the European ships, or permit any of their own vessels to fit out ostensibly for a foreign port, with a very few exceptions it has not afterwards taken umbrage at the emigration in which the former assisted, or with the latter, when they had visited a foreign coast, under the plea of stress of weather, or other necessity. The settlement of many thousand Chinese in Batavia, who had gradually emigrated from the southern provinces of China, could not have been accomplished without the knowledge or connivance of government, and it is indeed related in proof of the little regard paid afterwards by the mother country to these colonists, that on the occasion of a dispute having occurred at Batavia in which vast numbers of Chinese were massacred in that city, the Dutch government, who had thought necessary to state certain reasons to the Emperor of China, in exculpation of their conduct, were surprised to be informed in reply, that His Imperial Majesty took little concern in the fate of such of his subjects as had unworthily quitted their native country and abandoned the tombs of their ancestors. This circumstance is mentioned in the "Account of the Embassy to China," but full details of the particulars, together with much interesting information respecting that Chinese colony, will be found in a Dutch work entitled "Beschryvin van Batavia" 2nd part, 94th page et seq. The excessive population of many of the provinces of the Chinese empire, occasioning, in an unfavorable season, all the horrors of a famine, might naturally be supposed to induce the Government of that country to connive at a limited emigration, which would tend to the desirable object of enabling the country to meet with more certainty by its average produce, the consumption of its inhabitants, though the established prejudice against foreign emigration may continue to prevent an open avowal of their approbation.

The practice of recruiting in China with sailors of that nation, adopted by the Hon'ble Company's ships when a deficiency of hands in time of war or other exigency happens to require it, is now known to be attended with so little risk or difficulty, that without any previous application on the part of the commanders, our ships are frequently met and hailed in passing through the Bocca Tigris by Chinese vessels full of sailors in quest of employment, on hire, in any ship outward bound. The vast multitudes of Chinese who in the occupation of fishermen, devote themselves to a sea life and ply in all directions on the coast, renders it easy at all times to find men suited to the service that is required on such occasions, but with the class of labourers or husbandmen in China, such as might prove most useful in our colonies, the European Residents, under the limitations and restrictions by which they are at present circumscribed, can have indeed but little immediate intercourse. Though the facility of procuring persons of the latter description has accordingly been less, yet it has been found that the Chinese, who in considerable numbers, at different times and by different means, have been transported to some of our eastern possessions, especially that of Prince of Wales' Island, prove extremely useful to the several establishments, by their acuteness and industry as artisans, mechanics, or even labourers of the soil, though probably taken mostly from employments of a very different nature in the mother country. At the same time, however, I must acknowledge that the natives of China that came under my observation at Prince of Wales Island, appeared to me of the lowest and most degraded class and to have assimilated themselves in some respects with the native Malays, with whom they generally intermarried, in default of females of their own nation, whose recluse life and habits are probably the causes of their not usually if ever accompanying the other sex in such expeditions.

The lands cultivated by the Chinese at Prince of Wales Island, are, I understand, mostly parcelled out (as is customary in China) in small lots to individuals, who, as Proprietors or Tenants, have accordingly an immediate interest in the produce of the soil, but there can be little reason to doubt of their industry being excited and encouraged nearly in a similar degree by the prospect of an equal profit accruing from the wages of their labor, which might be applied to the improvement of plantations, the property and management of which were to be vested in others.

The cultivation of the sugar-cane being also well known in China, and the consumption of sugar very prevalent, while the excellence and cheapness with which that commodity is manufactured in that country is not to be disputed, it may be presumed that the labourers and manufacturers might be met with on enquiry in China, who would not only be willing and qualified to follow those employments in other countries, but might even suggest valuable improvements in the culture and preparation, of which we are hitherto unacquainted.

And lastly, it might be submitted in favor of the feasibility of a plan for employing Chinese on the plantations in the West Indies, that the common sustenance of the people, as well as the climate of those islands, could scarcely be otherwise than congenial to a native of the Southern Provinces of the Chinese Empire.

I have thus, Sir, mentioned every circumstance that has occurred to me, with which I could hope to throw any light on the subject of your enquiry, though I cannot but feel diffident of an opinion, founded on the limited information I possess of the several facts upon which it depends, and I beg to offer it with due deference to the judgment of others, whom you may be inclined to consult, and who may by their situation or capacity be better qualified to give you information on the several circumstances with which this subject is connected.

From every analogy however, from which an inference may be drawn, and from the opinion I am led to form of the character of the Chinese, I am certainly impelled to conclude that no injury could accrue from a judicious execution of the plan, as far at least as our interests and connexions with the Chinese Empire are concerned. A decided opinion upon its ultimate utility could not be justified without a personal knowledge of the West Inda Islands.

I have the honor,
&c. &c. &c.,
(Signed) George Thomas Staunton

(True Copy)

(Signed) N. B. Edmondstone,
Secretary to Government.

To John Roberts, Esq. &c. &c.
Sir,

In obedience to your desire I have been considering the practicability of forming a Colony of Chinese in the West Indies, and from my knowledge of the manners, habits and national prejudices of that people, I am inclined to think that though such an undertaking is by no means impracticable, yet considering the novelty of the thing, the caution and jealously natural to the Chinese character, their ignorance of the place destined to receive them and its immense distance from their native country, it would require some time and a judicious management of circumstances to ensure ultimate success to the undertaking.

The strictness and vigilance of the Chinese Government to prevent emigration is generally known, and more especially the almost insurmountable difficulty of removing women from that country, yet it is also well known that scarce a Portuguese ship leaves Macao, or a country ship sails from Whampoa, which does not take away numbers of the inhabitants, both as working seamen, and as passengers to Batavia, Malacca, Prince of Wales Island, Calcutta, Goa, &c. &c., and these men when once established in any of the English and Dutch Settlements, either as merchants, mechanics, or common labourers, almost always take concubines or female slaves from amongst the natives of the country, whose descendants intermarry amongst themselves, always preserving most religiously their original language, manners, and general habits, so much so that one whose grandfather was born in Batavia and Malacca, is not to be distinguished from a native of Canton.

Some years back the Chinese inhabitants of Prince of Wales Island were computed at 5,000; they must now greatly exceed that number, not only on account of their yearly migration from the mother country, but also their frequent marriages with the daughters of their countrymen by Malay and Siamese women, frequent instances of which I have witnessed during my residence on the island. The number in the Dutch Settlement of Batavia, is supposed to exceed 100,000, and in fact it was estimated at that amount in the time of the horrible massacre in the year 1740, when 30,000 of them were destroyed in one night by the Dutch. In short the number of them scattered over the different European Settlements in the East, more especially the English and Dutch, are very considerable and might certainly be further increased by due encouragement.

Although I would not wish to appear too sanguine in favor of the scheme, under consideration, nor inattentive to the difficulties that stand in the way of its success, yet I am strongly inclined to believe that if government were to hold out advantageous offers to a few settlers for a twelve month or two; and that these made a favorable report of their situation to their countrymen, the difficulty would be at an end. Numbers would volunteer from the different stations to join them, no undertaking being too arduous for a Chinaman, where there is a probable prospect of gain. Here however I would beg leave to suggest the propriety, perhaps the necessity, of establishing an agent in the centrical situation of Prince of Wales Island, with one or two respectable and intelligent Chinamen under him, whose business it should be to correspond with their countrymen in Batavia, Malacca, and China, and whose interest also it should be to hold forth and inculcate the benefits to be obtained from the proposed settlement in the West. By allowing one or more Chinamen of the above description a certain emolument or premium, that should bear a proportion to the success of the undertaking, it appears to me that the business might be greatly facilitated. I would observe in this place, that there is no employment in which the Chinese delight more than agriculture; that of Prince of Wales of Island is wholly in their hands, as well as almost every mechanic labor. If then a few of them were once settled in any of the West India Islands, on lands that were manageable and productive, I am inclined to think they would soon provide themselves with female partners from among the women of colour, always to be found in these Settlements.

The Chinese being far from delicate in their amours, and readily enough conforming to circumstances when once removed from their native country, not to return, besides the probability that married men, with their families might be among the first settlers, after a little time there is every reason to hope, that they would increase and multiply in the same proportion they have done in the Eastern colonies above mentioned, where they must have had many difficulties to surmount. Their industry, perseverance and domestic habits, together with their attention and care of their women and children, will ever be favorable to Chinese population.

I have, &c. &c.,
(Signed) K. McQueen,
(True Copy)
(Signed) N. B. Edmonstone,
Secretary to Government.

Mr Macqueen takes the liberty of submitting to Mr Sullivan, the following reflections on the subject of his mission to the East:

1st. The Chinese being naturally a cautious and jealous people, the prospect about to be held forth to them should be highly encouraging, and at the same time specified in explicit and unequivocal terms. They should be told for instance that Trinidad is a large fertile island, ceded to Great Britain at the late Peace, but hitherto little cultivated, that it is the wish of the British Government to have it inhabited not by slaves but by a free people, that the Chinese are preferable to all others as being natives of a warm climate and still more as being an industrious, sober, orderly people and that they may assure themselves of receiving every encouragement and protection under the mild influence of the English laws.

2nd. The first migration to Trinidad ought not to be very numerous, certainly not more than can be accommodated immediately on their arrival with such comforts as will remove their apprehension and secure their confidence, for on the reports sent back by the first adventurers to their friends in the East, the subsequent success of the undertaking will very much depend; letters will pass between them as the greatest part can read and write

3rd. The most desirable accommodation to a Chinaman is good eating, especially solid animal food, as beef or pork; animal food in short is their greatest luxury and a liberal supply of that article is more likely than any thing else to reconcile them to their new situation.

4th. They are sober, patient, industrious people, fond of agriculture and generally very skilful in it. Yet at the outset I should think it adviseable to allot for them such lands as they could manage without extraordinary efforts and which might yield them sure and encouraging returns the first season. The healthiness of the situation, should also be considered, since disease and death encountering them soon after their arrival could not fail of damping their hopes and prospects. In short, with due encouragement in the beginning, they are perhaps the finest people under the sun to answer the object now proposed.

5th. As the first consideration with these settlers will naturally be, to raise a plentiful supply of food, it will be wise to afford them every help in that pursuit, such as implements of husbandry, grain to sow, pigs and other stock to rear on. Their own industry, perseverance and ingenuity, joined to their ardent love of wealth, will soon enable them to extend their views to objects of commerce.

6th. As Prince of Wales Island is considered as the most proper place of rendezvous, Mr Macqueen is of opinion that he ought to repair thither first, in order to make the necessary arrangements. He is the more inclined to this as he is already intimately acquainted and even in habits of friendship with *Tikoo*, the Captain China there, a Chinaman of good understanding, probity and independent fortune and warmly attached to the interests of Government. With this man Mr Macqueen would wish to confer freely and confidentially and derive from him that assistance which his influence and extensive communications among his countrymen enable him so give.

7th. Mr Macqueen thinks it absolutely necessary to have an interpreter who can speak the Portuguese and Chinese languages fluently for though he himself understands a good deal of the former such as it is spoken in that country, he knows scarce any thing of the Chinese tongue.

8th. In regard to his own personal expences in the prosecution of this business, Mr Macqueen submits himself wholly to the pleasure of Her Majesty's Ministers and the Court of Directors: at present it is impossible to form any judgment of the thing, as it will necessarily depend on the extent of his travels and description of agents he may be obliged to employ and a variety of contingencies which can neither be foreseen nor calculated.

Mr Macqueen begs with all due submission to suggest the benefits he would probably derive from carrying with him strong and pointed recommendations from this country to the Governors and other superintendents of the different settlements he may be obliged to visit, as these would not only defend him from the probable effects of jealousy, but also secure to him such aid and co-operation as he may occasionally require, besides the respectability they would necessarily attach to the person that may be honored with the mission.

[A true Copy]
(Signed) N. B. Edmonstone,
Secretary to Government.

To His Excellency
The Most Noble Marquis Wellesley,
Governor General, &c. &c. &c.

My Lord,

As during the short period of my stay in Calcutta your Excellency's more important avocations may deprive me of the honor of personally addressing your Excellency on the subject, permit me to take this mode of stating the observations that have occurred after an attentive perusal of the papers respecting the establishment of a colony of Chinese in the British West India Islands, which your Excellency did me the honor yesterday to communicate.

Repeated trials have proved that the Chinese with great reluctance emigrate to situations they are unacquainted with, as this has been experienced in settlements comparatively near their own country and with which from the neighbouring establishment of their countrymen, they may be supposed to have had some knowledge, it is to be inferred that it would exist in a greater degree in forming any settlement so remote, and of which they are so entirely uninformed, as the Island of Trinidad.

The greatest difficulty in forming the desired establishment, will in my opinion arise from the strong attachment the greater part of the Chinese entertain for their native country and relatives, which exists in so great a degree that I believe few quit China without the intention of returning, whenever the advantage they look forward to will afford them the means, and in many instances it is not found that long absence has got the better of this predilection, though at Batavia and other places some remain from choice, and from a variety of causes others find a return to China impracticable.

With respect to the first difficulty, as it has invariably been overcome in every place where the attempt has been made, it is to be supposed that although a greater length of time will be required, that it will be ultimately conquered, even at the distance of the West India Islands.

The second obstacle must exist until a direct communication between China and the West Indies shall be opened, as suggested in the paper enclosed in Mr Macqueen's instructions. Should such a desirable event take place, although the difficulty of return would still be great, it would not appear so impossible as at present.

Notwithstanding these impediments, the love of gain is so strongly impressed on the mind of every Chinese, that I have little doubt the liberal offers made them by government will induce many, perhaps from 50 to 100, to embark and from the attention to their comforts during the voyage, and on their first arrival, which Mr Macqueen seems so well aware is essentially necessary, the report they will send to their own country I should hope would induce greater numbers to follow, and that this valuable race of people may in the course of some years be established in the British West India islands.

From the Chinese evidently experiencing much less difficulty in embarking on board foreign vessels at present than they did some years since, I am induced to believe the Chinese Government does not wish strictly to enforce the regulations supposed to exist for the *prevention* of emigration. Those desirous of settling in distant countries, are not however of a description to be much noticed by the higher officers of government, and their poverty affording no prospect of gratifying the rapacity of the inferior classes, are perhaps the principal reasons of their passing unheeded.

As it is possible any extensive encouragement to emigration by the Hon'ble Company might give offence to the Chinese Government, it may be considered advisable that the members of the Select Committee at Canton should not interfere in their public capacity. The assurance of the chief Supra-cargo, in the event of distrust arising, that the terms of their agreement will be strictly adhered to, and that they will be under the protection of the British Government, will I imagine answer every purpose required, and may be accomplished without danger of exciting the jealousy of the Chinese Government.

The success of the project will much depend upon procuring an active intelligent Chinese, to act in the capacity of what is termed at Prince of Wales Island and other places where the Chinese are established, Captain of the Chinese. The extent of his authority I am unacquainted with, but believe it consists in settling trifling disputes, and making other little arrangements among themselves. A person of this description as well as the other settlers I should conceive would be more readily procured in China, than at Prince of Wales Island, as it is to be considered that those who emigrate, are with a few exceptions, perhaps the lowest and worst class of Chinese, and that those among them possessed of ability and industry, find such encouragement that they will not be induced to quit their situations. The refuse therefore of such a description of people could not be a very valuable addition to any settlement.

With all due deference to the superior information your Excellency may be furnished with, I should propose that Mr Macqueen proceed to Canton, touching at Prince of Wales Island,

and should he find that I am mistaken in supposing that he could not there procure useful men, he may engage such as are willing to embark and complete his numbers either at Canton or Macao. If he is able to prevail upon the most respectable among the Chinese resident on that island to recommend the proposed settlement to their friends in China, it would perhaps facilitate his procuring persons suited for the service required.

It is unnecessary for me to make any observations on the line of conduct to be observed by Mr Macqueen on his arrival in China, as from the present Chief of the Hon'ble Company's factory your Excellency may rely on his receiving every assistance that abilities and experience can render, joined to the most zealous exertions to promote an object so important to the interest of the British nation.

I have the honor to be,
&c. &. &c.
(Signed) J. W. Roberts.

(True copy)
[Signed] N. B. Edmonstone.
Secretary to Government.

Calcutta, 24th May, 1806.

Observations on the proposed plan of introducing Chinese settlers at Trinidad and our other West India Islands, and of opening a direct intercourse of trade between the East and West Indies.

It must be obvious to those who contemplate the convulsions that have lately taken place in the West Indies, together with their probable consequences, that the project of substituting Chinese labourers in lieu of African slaves, if it can be carried effectually into execution, embraces objects both in a political and commercial point of view of the utmost importance to the British nation.

2. But as the nature and tendency of this measure will have undergone due consideration and discussion by His Majesty's Ministers, who are most competent to appreciate the beneficial consequences likely to result from it, I shall confine my observations to the object of promoting and facilitating the execution of the desired project. The locality of my situation during the last nine years, and the experience which I have acquired of the views, character and propensities of the Chinese emigrants who have scattered themselves diffusely over the Molucca Islands and other Eastern settlements which I have visited, will enable me, I trust, to submit some suggestions worthy of consideration, which I shall endeavour to do in as concise and perspicuous a manner as possible.

3. The Chinese Government has been considered ever since

Europeans have had any opportunity of observing their polity, remarkable for exercising the most arbitrary laws and usages.

4. There appears therefore strong grounds to question the validity of the received opinion that the emigration of the Chinese is at variance with the positive orders and intentions of their Government.

5. If the emigration be absolutely contrary to the interest and orders of the Chinese Government, we must attribute the unlimited violation of this law to the want of an efficient and pervading controul, or suppose that a systematic corruption governs the conduct of every public officer, from the highest to the lowest order.

6. But if emigration be connived at by that Government, which I am inclined to believe is the case, we shall find as little difficulty in accounting for the number of Chinese who avail themselves of the indirect concurrence, as for the motives which influence Government to yield the indulgence, both of which may be traced to the same cause, namely, excess of population. In a country like China, where there have been, comparatively, but few wars, and no pestilential diseases to thin their population, its consequent redundancy operates both as a calamity to the people, and as an evil to the Government and requires to be cautiously guarded against.

7. It might not appear suitable to the dignity nor consistent with the interest of the Chinese Government to avow indifference to emigration, but I must believe this sentiment to operate so long as the paradox shall remain unexplained,—why a Government so conspicuous for arbitrary Laws and Usages, so severe and vigilant in its police and so summary in its punishments, should be uniformly disobeyed with impunity in so very important a branch of the public economy?

8. The causes of this glaring deviation from prescribed Laws, are fair subject of speculative discussion, and are deserving (as connected with the project in view) of further enquiry, but the question of emigration as it is and has long been practised admits of no doubt. It is an undisputable fact, that many hundred thousands have already emigrated from China and that many thousands continue to emigrate annually. I can therefore see no material obstacle to be encountered (whilst the Government of China continues to be administered as it is at present) in persuading large bodies of their male inhabitants to emigrate and establish themselves in our West India Islands, if adequate advantages be held out to them in the first instance and their confidence in us be secured by the fulfilment of our promises.

9. The difficulty on the score of watchful jealousy on the part of the Chinese Government being, I trust, in some measure removed in the foregoing paragraphs, it may be necessary to remark upon the line of conduct that ought to be pursued by

the person to whom the management of this service may be committed. Upon this point the success of the undertaking principally depends, and I therefore trust I shall stand excused, if I venture to submit, with all possible deference, an opinion on this head, which differs in some respects from the mode of proceeding which has been suggested for the guidance of the British Agent by His Majesty's Ministers, and the Secret Committee of the Hon'ble the Court of Directors. I allude to the secrecy recommended, and the strong injunctions contained in Mr Macqueen's Instructions to prevent the real objects of his voyage being discovered at any of those parts which a Chinese population may induce him to visit.

10. This recommendation may be applicable, in a certain degree, to the Chinese Government, in as much as that the project ought not to be made a matter of public negociation between the two States, because as I have already observed, although the Chinese Government connive at, they may never openly countenance a spirit of emigration, but in all other respects and at all other places, the very nature of the service (if conducted upon a scale calculated to render immediate advantage) precludes the possibility of secrecy, and if it did not, I must humbly beg leave to offer it as my opinion, that a candid avowal of the objects of Government is infinitely more likely to ensure the success of the measure than the pursuance of a conduct so much at variance with the character which we have hitherto established at the different Settlements where Chinese Emigrants at present reside. The British Agent cannot proceed in any considerable degree to forward the object of his Mission, *without attracting the attention not only of those Individuals with whom he may be treating but of the Community at large wherever he may be stationed*; therefore I am persuaded that secrecy or rather the *attempt at secrecy* is likely to create that distrust in the Chinese Emigrants which is in truth the only dangerous rock upon which there is any risk of striking; while a candid declaraction of our intentions is calculated, and promises fair to produce all the success that has attended European exertions to introduce a Chinese population at Prince of Wales Island, Malacca, Batavia, Moluccas, and other Eastern settlements. I would therefore propose to divide the method of procuring Chinese emigrants into two heads, first with respect to those to be obtained at China, and secondly, with respect to those who are to be procured in the different ports in the Eastern Archipelago. In the first place it will, in my opinion, be advisable to follow the method that has heretofore been practised in peopling other European and Malay settlements. The deputation of any *accredited agent* to China, or the detection of any mysterious proceedings in the Chinese dominions, might naturally create suspicion on many accounts, and occasion obstacles to be thrown in the way, whereas if the ordinary custom of procuring Chinese

be resorted to, the usual system of conniving at emigration will most probably be observed by the Chinese government. The emigrants may be shipped for Prince of Wales Island, as the port of rendezvous, where the ulterior arrangements may be easily effected. In the second place, that is, at Prince of Wales Island, or at any other port not subject to the Chinese government, but where an extensive population gives reason to hope for a successful attempt to procure emigrant settlers for Trinidad, it will be proper to signify in a frank manner, the nature and extent of the aim of the British government, and to state that Trinidad is a fertile island which has been lately ceded to Great Britain, where we wish to encourage Chinese cultivators and artificers to settle, in the same manner as is customary in other infant colonies under our government, but that, as it is more distant than the islands to which they have been in the habit of emigrating, indulgences of a more extensive nature will be granted to them as an encouragement to their industry and spirit of enterprize. I would not recommend even that any degree of particular anxiety be evinced on the occasion. I consider it indeed of the utmost importance that not a shadow of doubt should find its way into the minds of such Chinese as actually embark for Trinidad, with respect to the justice and integrity of our intentions towards them.

11. The intended extent of the present project, and the rapidity with which it may be carried into execution (which are points naturally connected with the expence that it is likely to occasion) merit particular attention.

12. If an emigration only for a few families is to take place in the first instance, as adverted to in Mr Macqueen's instructions, and on their report to their friends in the East, a second supply of cultivators is to depend, and so on, the progressive influx will be trifling, and the maturity of the project tedious; and such means must prove very inadequate to the greatness of the design, and the extent of the benefit calculated upon by His Majesty's Ministers. Grand objects of national importance demand great and vigorous measures, and as His Majesty's Ministers and the Secret Committee of the Hon'ble the Court of Directors attach the highest consideration to the successful issue of the present project, as appears by the following observation (where they advert to the extent of tonnage to be provided for the settlers):— that "the government of India should not only be regulated by a "consideration of the length of the voyage, and of the novelty of "the undertaking, but by a due attention to the importance which "is attached to the introduction of this industrious and useful "class of settlers into the island of Trinidad." Under such circumstances I say every effort should in my judgment be made to prevail upon at least 3,000 persons of this description, to embark during the first year of the undertaking. The scheme of introducing a small number at first and trusting to the result of

their report, I consider so defective, that I would resort to it only after every exertion to accomplish the more extended system, either wholly or generally, had failed. Accidental sickness or partial misfortunes might completely frustrate the plan: whereas, if we can once introduce 3 or 4,000 Chinese, we may consider the measure established on the basis likely to ensure a permanent and rapid progress, proportioned to the magnitude of the views of government.

13. To commence the prosecution of the scheme upon the scale above recommended, will, of course, involve government in a very considerable expense in the outset,—but under all the circumstances attending it, I feel a well grounded conviction that it ought either to be conducted on this grand scale or abandoned altogether. Any plan contrived upon a narrow principle would prove, if not entirely nugatory, extremely tedious in its operation, and although the expense attending it might appear comparatively small, it would in reality be extravagant, inasmuch as that the whole expense, whatever it may be, would prove a total loss to government.

14. After making these preliminary observations on the general conduct of the plan for procuring large bodies of Chinese emigrants, I am next to consider the method and objects that ought to be attended to, in conveying them to distant colonies, to suggest the mode of treatment best calculated to secure their attachment, and to describe the habits and customs they revere, though residing in foreign lands, and which they cannot be weaned from, without the risk of essential injury to the proposed undertaking.

15. The ports of rendezvous or transhipping, ought to have capacity for furnishing such a supply of provisions and necessaries as the Chinese have been accustomed to. This kind of supply will gratify them, and be less expensive to government, than our usual routine of equipment. It may be useful to observe in this place, that if Prince of Wales Island, the most central situation in the East Indies, be considered the port of rendezvous, no loss of time in the passage of the Indiamen would be occasioned by their calling at that settlement, in order to land the Chinese, whom they may have shipped at China. The ships which passed through the Straits of Malacca with Admiral Rainier in 1796-7, made a better passage home than they generally do through the Straits of Sunda, and as the equipment of the Chinese can be completely executed among their countrymen at Prince of Wales Island, this arrangement would have a wonderfully good effect.

16. With respect to their passage, I am of opinion that it should be granted to them in the first instance, free of expense, and that this practice should continue so long as it shall appear advisable to augment the number of Chinese settlers at Trinidad, but whenever government may have reason to believe the introduction of this useful set of men shall have been sufficiently

established to ensure success, they may grant them their passage on condition of being repaid by small monthly instalments from their labour, which I am confident they would gradually accede to, and punctually perform.

17. They should have comfortable accommodations on board ship, and as China and the Eastern Islands abound with hogs (the favorite food of the Chinese) a sufficient quantity should be put on board to admit of their having a fresh meal once or twice a week as well in order to prevent the scurvy, as to encourage them to embark. They have not those religious prejudices that render the natives of India so troublesome on board ship.

18. Care should be taken that they be landed in a healthy situation, and that orders be sent to Trinidad to provide some temporary habitations for them on their debarkation, so soon as it can be ascertained with any degree of accuracy to what extent the plan is likely to succeed.

19. Parcels of land might be distributed to the first Chinese settlers with good effect, and when any of them obtain the means, there should be no more objection to their possessing landed property on the island than to any other free class of planters, and to the same extent. They are great speculators in agriculture, take indefatigable pains with their lands, and cultivate them at less expense than almost any other description of people.

20. A piece of ground must be set apart for their place of worship, and another for their burial ground. I need scarcely add that the Government must be particularly cautious to prevent any interference in their religious ceremonies, to which many singularities are attached, but none I am happy to say that demand human sacrifices or otherwise revolt against humanity. The practice of certain acts of cruelty, which are sometimes committed in their own country, especially during warfare, does not accompany them to foreign ports.

21. A hospital should also be constructed for their exclusive use and the captain or chief ought to be held responsible for the care of the sick, poor and infirm, who have no means of gaining a livelihood by their industry, for they are individually strangers to the feelings of a general humanity and they will pass on totally regardless of the cries of want or pangs of misery, unless the suffering object be one of their own relations.

22. It would be just and equitable, for the purpose of defraying this expense, to farm (as is the case at Pinang) the exclusive privilege of selling Pork (which is a favorite part of the food of the Chinese as I have already observed) at a certain rate, in order to raise a revenue upon their consumption thereof adequate to the maintenance of the poor and infirm; and this fund ought to be placed under the immediate superintendence of the Captain subject to the inspection and controul of the Government.

23. The habits and dispositions of the Chinese lead to commer-

cial and speculative pursuits in a very extraordinary degree, and it happens often that their property in Lands, Houses, &c. is mortgaged for loans of money borrowed in aid of their commerce, or farming projects. It may be therefore necessary for Government to provide against the introduction of exorbitant interest, which these adventures lead to, and have invariably produced, when not restrained by a due controul. It is a very difficult task to sift their deep concerted plans of usury; but as it entails certain calamaties upon themselves and consequent prejudice to the views of Government an interference is indispensibly necessary. Twelve per cent is the legal interest in the country and at all British ports where Chinese are at present settled, but the interest that it may be expedient to limit the Chinese to in the West India Colonies, must of course depend upon local circumstances. They certainly ought to be allowed to borrow at the highest interest that the country will possibly admit of, as their indefatigable industry and abilities will always render their capital more productive than that of any other competitor on the spot.

24. With respect to the policy and civil and criminal laws which may be most congenial to the Chinese settlers, I am of opinion that in criminal matters the English penal code is perfectly unobjectionable and has this advantage over the Chinese laws, of doing "justice in mercy" a divine principle that their corrupt and sanguinary courts of justice do not admit to have any place or influence in their decisions.

25. The municipal laws ought however to be regulated by a due regard to those statutes which time has rendered dear to them, and to the continuance of which (more especially as we are to be the principle gainers by their emigration) it may be argued on the broad and liberal basis of reciprocity, that their native and established usage will give them a prescriptive right.

26. The important question of succession to property in China is founded on different principles from those which govern the English Laws of succession, and this and many other points of Civil Law, which are absolute in their own country, they are particularly tenacious of preserving in the utmost purity. To enter into a detail of the numerous variations and distinctions between the English and Chinese Laws, would engage me in a tedious disquisition and exceed the limits I have prescribed to the suggestions which I have the honor of submitting. I shall content myself therefore with observing, that in India the decision of His Majesty's Judges is guided in a considerable degree by the laws of the natives between whom the dispute exists, and I should suppose every man free from prejudice will concur in the propriety of such a concession, so long as it is not repugnant to the principles of equity. Although it may be difficult, if not impracticable to obtain such information of the Chinese laws as would lead to satisfactory conclusions upon all occasions, still this difficulty ought not prevent

our endeavouring to collect the best possible information on the subject, and if we are prevented by insurmountable obstacles at present from administering justice agreeably to the letter, we ought to adhere as closely as we can, to the spirit and forms of their laws, with a view to reconcile our new subjects to their new situation, and thus conciliate their attachment.

27. Being accustomed in their own country to a rigid police, they will readily submit to regulations established for preserving the peace and good order in a British colony. Indeed a severe police will appear indispensibly necessary when we consider that it is the only check that can be applied to their habits of debauchery and that great laxity too often generates the idea that no competent control exists. They ought therefore in all their exertions, to feel the hand of power, and know that a government vigilant and active is observing them. Thus they may be made the most obedient and profitable subjects in the world.

28. After having enumerated so many customs and habits peculiar to the Chinese, which we have it in our power to allow them to follow with propriety, it would not be fair nor consistent with the interest I feel in the undertaking, to omit noticing an objection that may be stated to the probable success of it. It is to be observed that, among the inhabitants of China, the people most inclined to emigrate are the poorest, whether artificers or husbandmen. But neither of these however poor, ever quit their native country without hope of returning, and that the place they are going to admits of an intercourse with their relations and friends whom they leave behind, to whom they invariably transmit either annually or more frequently if opportunities offer, a certain proportion of their earnings.

29. At the Eastern Islands junks from China annually arrive in the favorable season, and bring a great number of people to take up their residence in those quarters. These vessels likewise import various kinds of Chinese merchandize. When the monsoon shifts, the junks return, laden principally with gold dust, pearls, tin, birds' nests, beche de mar and pepper, and *convey back those emigrants who have made their fortunes, and the consignments of others, either in kind or specie to their friends.* I think it therefore my duty to draw the particular attention of Government to the absolute necessity which will exist, from the period of our introducing Chinese settlers at Trinidad, for opening and continuing and a regular intercourse between that island and China, or what will perhaps be more convenient to us, between Trinidad and the port of rendezvous, not only with the view of progressively augmenting our population in the West India islands, but even after that object shall be accomplished, for the purpose of affording an indulgence to the settlers which no consideration will ever induce them to forego. It is almost superfluous for me to remark that it is utterly impossible for Chinese junks to be

navigated in the boisterous seas of the intervening oceans. Therefore if the necessity of maintaining a regular intercourse between the two countries be admitted, British vessels are the fittest to be employed upon this service, and such an establishment must necessarily incur a considerable expense to Government. It may however appear to Government in the subsequent remarks (after I shall have completed my suggestions on the treatment to be observed towards the Chinese settlers,) that by a due attention to the commercial objects which such an intercourse will present, the objections grounded on expense, are of less importance than upon a cursory view of the question they may appear.

30. In alluding to the fond hope and desire that Chinese emigrants invariably cherish of returning to their homes so soon as their fortunes are made in foreign countries,—an inclination which it would be unjust, as well as impolitic to put any restraint upon it,—may be remarked that as the number of poor emigrants proceeding to the West Indies, will always exceed the number of rich returning, this predilection will not greatly interfere with the increase of population expected, more especially as the Chinese always cohabit with the native women of the country they reside in, as fresh emigrants will annually arrive, and no female is ever admitted agreeably to the laws of China, which are in this instance rigidly enforced;—the return of a few males can never be found any essential impediment to the grand plan of engendering a colony of free and industrious inhabitants. With a view to counteract in some measure the natural propensity of the Chinese emigrants to return to China so soon as they have amassed a small competency, without any otensible restraint, it may be good policy both to admit of their indulging in luxuries (which they are passionately fond of) and to assess the indulgence in order to keep them poor, and thus protract their return until time shall have effaced from their memory those endearments which stimulated to a desire of revisiting their home, and substituted other local attachments of a more binding nature on their affections. But God forbid that such a benefit derivable from their luxuries, should be considered in any other light than as the free and uncontrolled result of their own inclination.

31. I would willingly proceed into as full an examination of the great additional importance that the proposed project is likely to derive from its commercial tendency, as of the other points I discussed. But on this subject I feel myself inadequate to offer any statements founded on personal experience, or such authentic and accurate information as could be relied on without doubt or hesitation. I must therefore beg leave to refer to the superior knowledge of those persons who, from long habits of intimacy with the trade carried on between India, the Phillipine Islands and China, and South America, may be enabled to afford Government much useful elucidation, and shall confine myself to

observing generally, that there appears to me no ground to doubt that the benefits of a commerce consequent to, and in some degree connected with the Colony proposed, will give great facilities to a Trade with South America, which independent of such a colony it would not possess, and that they will jointly be the basis of an extensive and intimate link of connection between the British empire in the East and West Indies.

31. Whether or not any evil consequences are likely to result to the mother country from the introduction of a greater proportion of Eastern merchandize in the West Indies by any direct conveyance, than is adequate to supplant the Spanish and American trade that I have alluded to in the preceding paragraph, I leave it to those who are better informed than myself to determine. I believe that a very considerable trade is carried on in chintz, muslin &. from the port of London to the West Indies, and it may be considered by some perhaps, that a competition set up in this country, on the advantageous terms that a direct export from the East to the West Indies would afford, will be prejudicial to the spirit of mercantile adventure in England, and tend to injure the essential Revenues of the State. It is not in my sphere, nor will I presume to appreciate all the bearings and relations of a question of so much importance to a great commercial nation, but it strikes me that no trade of this nature could be opened and conducted except by, or under the immediate control of the Honourable the East India Company, without exposing their chartered rights to a great danger in that quarter of the world where their trade is most productive, and therefore I conclude that no such measure will be adopted, unless the Honourable Company be a party to it, without a just regard being had to their rights and interests.

32. Before I conclude these speculative observations, I have only to add that, in submitting them to the consideration of the Governor-General, I respectfully beg leave to impress his Lordship with the idea, that from what I have stated I by no means wish it to be understood that I pledge myself to the successful issue of the scheme, however ably it may be conducted. My aim has been to suggest the most probable plan of accomplishing the views of government, by removing what appeared to me imaginary obstacles, and by explaining, as far as my personal experience goes, some essential points relative to the usages and habits of the Chinese. I shall feel amply recompensed if my present endeavours prove so fortunate as to afford one useful hint to government, and I can further venture to affirm with great truth that if Prince of Wales Island be considered a proper place for the rendezvous of the Chinese, and for conducting the general arrangements connected with their dispatch to the West Indies, I shall always be ready and anxious to promote the success of the undertaking to the utmost of my abilities.

(Signed) R. T. Farquhar.

Calcutta, September, 1804.

Extract of a Letter from John Lumsden, Esq. Chief Secretary to Government at Fort William, to R. T. Farquhar, Esq. Lieutenant-Governor of Prince of Wales Island &c.

Dated 11th Nov. 1804.

The intentions of His Majesty's Ministers and the orders of the Secret Committee of the Honourable the Court of Directors on the subject of the Mission on which Mr R. McQueen has been sent out to India by His Majesty's Ministers, have been communicated to you in confidence, and the Governor-General in Council is in possession of your sentiments with respect to the means by which the object in the contemplation of the British government is, in your judgment, most likely to be accomplished.

2. The determination of the course which it may be proper to pursue on this important question will require deliberate consideration, and in the meantime it is extremely desirable that His Excellency in Council should be in possession of the fullest information which can be procured with respect to the practicability of inducing any considerable number of the natives of China to settle on the island of Trinidad.

3. With this view Mr Macqueen has been directed to proceed by the earliest opportunity to Prince of Wales Island for the purpose of making, under your direction and control, the necessary preliminary arrangements with reference to the ultimate prosecution of the plan suggested by His Majesty's Ministers, on the scale described in the notes submitted by you to His Excellency in Council.

4. You will accordingly direct your attention to the subject immediately on your return to Prince of Wales Island, and you will employ Mr Macqueen as you shall consider to be most expedient for the purpose of carrying the intentions of government into effect. You will not however adopt any final arrangement for the dispatch of any Chinese settlers to the West Indies, nor incur any considerable expense in the prosecution of the plan, until you shall be in possession of the further orders of the Governor General in Council on the question, with which you will be furnished after he shall have received such additional information as you may be enabled to communicate in regard to the probable success of the measure in contemplation, in consequence of your local enquiries at the Eastern Islands."

A true extract

[Signed] R. T. Farquhar.

Extracts and substance of a letter from the Agent to the Governor-General with the Malay States, to His Excellency the Most Noble Marquis Wellesley K. P. Governor-General in Council, dated Prince of Wales Island, *27th March* 1805.

In obedience to your Excellency's commands, received in Mr Secretary Lumsden's letter of the 11th November 1804, my first object on arriving at Prince of Wales Island, was to obtain further intelligence from all quarters respecting the project of introducing Chinese Settlers at Trinidad, and I am happy in being able to state that the information I have acquired, is highly favorable to the views of His Majesty's Ministers.

2. Without taking up your Lordship's time with a recapitulation of the speculative opinions that I had the honor of submitting to your Excellency's consideration at Calcutta, I shall only beg leave to refer you generally to that document and confine myself in the present suggestions to observing on the practical part of the undertaking, arranged under the following heads viz.

1st. The practicability of peopling Trinidad with male Chinese.

2nd. The easiest mode of procuring Chinese, and conveying them to Prince of Wales Island as a Port of Rendezvous.

3rd. The mode of transporting, victualling, and accommodating such Chinese from Prince of Wales Island to Trinidad.

4th. The preparatory steps necessary to be taken at Trinidad for their accommodation and the encouragement proper to be given when they arrive there, in order to create, with the greatest possible rapidity, a resident population and a productive cultivation.

5th. The mode in which government may consistently be reimbursed all, or part of the expenses incurred in procuring and transporting Chinese to Trinidad.

6th. General reflections tending to combine the trade which the supply of a Chinese colony at Trinidad with necessaries will give rise to, with the general trade to and from the East and West Indies and South America.

3. First—The policy of the Empires of China proper, Tonquin and Cochin-china, Cambodia, Siam and Ava, respecting emigration, is notorious at all the Eastern Islands that I have visited. They obviously tolerate, or connive at the emigration of their male subjects, and allow them to go wherever they please, without enquiry, or restraint, but prohibit the emigration of females under the most severe restrictions and penalties.

4. This information is founded on the experience of the oldest inhabitants, and corroborated by daily observation; for male Chinese are extremely numerous at Prince of Wales Island; and at all the countries in its vicinity; but in no part do we find females that nation. It is true there are many Siamese women at

Quedah and its environs, but they are the remains or descendants of those who fled from their country when overrun by the Burmese about 40 years ago. This striking feature of the policy of the Chinese government is further exemplified by the ease with which ships engage Chinese sailors at Canton, the facility with which Captain Mears is stated to have procured Colonists for Nootka Sound, the indifference manifested by the Chinese government to their countrymen massacred at Batavia, as described by Mr Staunton, and by the knowledge we possess that two ships from Macao last year conveyed several male Chinese to Bencoolen without any interruption. These are facts, which if they be not in point of proof quite as convincing as an inspection of the actual Archives of the government referred to, are certainly next in order to it, and consequently, I presume, may be relied on without any further reserve of doubt.

5. The result of this information presents a facility in procuring males, and a difficulty in procuring females equally unforeseen by His Majesty's Ministers.

6 As the providing females from any of the countries above specified, or from the great Eastern Archipelago, cannot be depended upon, government must rely on the resources of India, the West Indies, or America, for a supply of females.

7. I trust therefore, and indeed take it for granted, from the accounts that have been published of our West India Colonies, that there can be no room to doubt the practicability of procuring females in the proportion of one to ten males, and that the same number may be obtained annually. This supply may be equal to the number of men who will become householders, and form the basis of a resident population, which as the Chinese are prohibited by their own laws from conveying the females of any other country into China, will rapidly increase

8. Secondly. Emigrants have heretofore left China principally in junks clearing out from one port of that country to another, foreign trade being ostensibly prohibited by Edicts. Such emigrants pawn their persons to the owners or Captains of the junks for a passage and victuals to the amount of 20 Spanish dollars or 4 £ sterling, which they borrow on arriving at the place of their destination from relations or from the cultivators whom they engage to work for, and repay by monthly deductions from their wages. This kind of negociation is now grown into a regular system of trade to the extent of 10 or 12,000 men annually, and has at this day half peopled the Islands of the great Archipelago. Chinese have also left their country in European vessels as sailors, artificers &c. upon settled wages and in various other wages It is not reasonable to suppose that all the facilities which the junks afford, can be made immediately applicable to the success of the scheme, as it will require time to establish the routine, and draw the attention of junk owners to so novel an

undertaking. But it appears to me that the mode adopted by these Chinese will be the best precedent for us to follow, when a more regular trade shall have familiarized or rendered the new plan more generally known.

9th. In the meantime the Captains of Europe ships, who have long been accustomed to recruit their crews with Chinese sailors, and to convey Chinese passengers in various parts without meeting with any obstacles, may be directed to engage one hundred for each ship on the most economical terms. The providing these people at China should in my opinion, be left as usual to the Compradores, without the appearance or affectation of mystery, and they may thence conveyed to Prince of Wales Island as the port of rendezvous. One month's provisions should be shipped at China by the Company, or a stated allowance made to the owners of the ships on account of the victuals and passage of the the Chinese.

10. It is a matter of no consequence whether the Chinese are engaged as sailors or settlers in the first instance, for although it may not perhaps be thought altogether so regular to ship Chinese as sailors, and afterwards transfer them as settlers, nevertheless as ailors shipped at Canton, daily land at Prince of Wales Island, and the Eastern countries, *and as they invariably embark with the ultimate view, and eagerly embrace the very first opportunity of becoming settlers,* no difficulty is to be apprehended in effecting the exchange.

11. In this mode great numbers of common labourers may be engaged, but the Chinese who are to take the lead in this plan, and to communicate with the British government as responsible men should be carefully selected by the Company's Supra-cargoes, be conversant with the British character, speak English and have liberal allowances. They should be sent as passengers in the ships on which their brethren embark, but they should not act in the stations they are intended to fill until their arrival at Prince of Wales Island. The principal men may be comprised in the Captain, and three elders, two writers, and one steward for every 500 men, with the necessary contingent of cooks and doctors.

12. The foregoing arrangements is the best that can in my judgment be adopted for procuring male emigrants adequate to any demand, and if females in the proportion already stated, or greater can be obtained annually, the population and cultivation of Trinidad will soon be completed and serve as a precedent for superceding the necessity of employing Coffrey slaves in our other West India possessions.

13. Thirdly.—In considering these points, I shall treat the subject as if there existed no bar, grounded on the chartered rights of the Hon'ble Company, against entering into general terms with ship-owners at large, persuaded that whatever commercial advantages can apply to the individual, will in a much stronger degree be found applicable to the Company, whose connections are

already established and whose local superiority on various grounds is so obvious. With regard then to the transportation, victualling and accommodation of Chinese colonists, the ships engaged for this purpose should be large enough to convey 500 men each, and the commanders and officers should be licensed in India and China to load merchandize for Trinidad, subject to necessary regulations, and to the express condition of calling at Prince of Wales Island for the Chinese, their provisions and water for the passage, together with 12 months extra supply of rice, salt, oil, ghee and arrack. Five bags of rice for each man per annum, and the usual allowance of other articles will be sufficient. It is desirable that such provisions as may be laid in for the consumption of the Chinese settlers, should be purchased by persons of their own country, properly superintended. That each ship ought to carry 12 months supplies for the consumption of the passengers, after their debarkation at Trinidad will appear necessary, if we consider that the Chinese will meet no middle class of inhabitants in our West India Islands,—consequently they may not find provisions fitted for such a class, and if they do, what may be procurable will certainly not be suited to their habits. By taking provisions and necessaries along with them, they will at once be enabled to commence as a middle class, and become immediately reconciled to their new habitations.

14th Each ship should likewise carry a small investment of coarse China-ware, China paper, writing utensils, hats, shoes, and nankeen, and other China articles, which should be provided at the expense of government, and sold to the settlers on moderate terms, and if articles be required, they should be furnished with their implements.

15th. This equipment may perhaps occasion a disbursement not foreseen, but as the Chinese will punctually pay for what they want as issued, either in cash, or by labor, the first advance will be the only inconvenience to government, and in order to diminish this expense as soon as possible, an ample stock of swine to breed from, and a liberal supply of all kinds of seeds and roots most used by the Chinese, should be immediately sent to the islands destined for their reception. When the demand becomes steady, the whole business of transportation and supplies might be trusted to the speculation and enterprize of individuals.

16th. The rapid success of population, as connected with comfort on the passage, and health when in the West Indies, will depend, in a great measure, on the attention paid to this part of equipment, it should therefore be put under a control in which the most perfect confidence may be reposed.

17. Fourthly—Tents or huts, and store-houses, should be prepared for the reception of the Chinese and their provisions at Trinidad in a healthy situation, where they can reside until they find masters or employment, and during this period they should by victualled by government as on board a ship. Should European cultivators

engage any of the Chinese, the agreement ought to be made with the knowledge, and under sanction of government, and be formally registered in an office for that purpose. These instruments should specify such sums as the new settlers are bound to repay to government by monthly instalments for advances received by them, or the whole debt to government may be liquidated by a fresh advance from the cultivators, but in either case, the agreements should be registered with the view to preclude the possibility of injuring the new settlers.

18. Parcels of land might be distributed with good effect to the first Chinese adventures and when any of them obtain the means, there should be no more objection to their possessing landed property on the island, than to any other free class of planters, and to the same extent. They are great speculators in agriculture, take indefatigable pains with their lands and cultivate them at less expense than almost any other description of people. One man can labour with the hoe 2½ in a year. In general they are adepts in the manufacture of sugar, arrack, indigo, and silk; the culture of tea will be well worthy of experiment, and tea seed can be furnished from Prince of Wales Island.

19. Although Trinidad does not offer such advantages either for increasing the numbers or for accommodating emigrants, as the countries in the vicinity of China, yet if their customs and religion be respected, if aids be afforded them in money and lands, so as to enable them once to acquire a capital, such is their spirit of enterprize and industry that they will discover and turn to account all the advantages, whether in point of agriculture or trade, which the situation possesses, with a promptitude and and perseverance that will astonish even Europeans. The Chinese who at present reside at Prince of Wales Island, brought no property of any description with them. The advances made to them by government or individuals, have not in the aggregate exceeded £30,000, which sum has been, or may on demand be recovered. They began cultivating about the year 1793, their revenue at this date 1805, may be estimated at least at £ 100,000 per annum.

20. These circumstances point out the propriety of giving to the Chinese settlers lands in perpetuity. Ten orlongs, (an orlong is a measure of 40 fathoms square, well known amongst Chinese) for each man may at first be enough. As they acquire capital they will purchase estates, and I make no doubt but it will soon be discovered that they manage their lands with an attention and dexterity unexampled in the present cultivation in the West Indies, but as they will be in the outset utter strangers in a distant land, Government for a time should extend to them a peculiar degree of protection and encouragement, in order that the report of those who return may be favorable to an increase of population. —This protection should be particularly directed to prevent their headmen from oppressing them; and in order to compensate for

little hardships which will be impossible to obviate altogether, government may refrain from levying the local tax of 3 per cent at Trinidad, or indeed any other taxes to which the present inhabitants are liable, until they acquire numbers and capital, when they will be found one of the most productive sources of revenue in the West Indies.

21. Fifthly—When the ships import at Prince of Wales Island, the head man and one or two of the elders should proceed on board as they arrive in the harbour from time to time, take a list of the Chinese to be landed, and obtain provisional security from their friends, or masters, (if they take employment at Prince of Wales Island) for the amount that may be then due to government for the advances made on account of their victuals and passage. If this measure be not adopted on the score of economy, it will be requisite that it should be observed for the sake of policy, in order that the emigrants may be forthcoming whenever they may be required to prosecute the voyage to Trinidad. Should the emigrants at a future day decline proceeding to Trinidad, the amount of the demand on such emigrants (if any be made by government) for the advances on account of victuals and passage thus far, should be permanently and ratable fixed in order that custom may confirm the transaction. I shall observe by the way that I not aware of any objection to the Chinese emigrants laboring at Prince of Wales Island, until the equipment for the West Indies is prepared, nor can any detriment arise from an exchange, if one man procure another as his substitute.

22. The expenses of shipping, conveying, and victualling emigrants from China to Prince of Wales Island, will be about 25 Spanish dollars each. I estimate the expense from Prince of Wales Island to Trinidad, at doubt that sum, so that the whole may amount to 75 Spanish dollars per man; but if an unlimited license to trade from China and India to Trinidad were held out to ship-owners, as an equivalent, it would in my judgment relieve government from all such expenses, or lower them to a very trifling sum. However, to the delicacy and importance of this question (as one liable to involve the Chartered Rights and Interests of the Hon'ble Company) I have already endeavoured to draw your Excellency's attention, and I have also submitted as my opinion that, if individuals found the trade advantageous, the Company must find it more so. I therefore conclude that any commercial intercourse which may be induced by the introduction of Chinese settlers into our West India Islands, will be placed upon the same footing, or nearly so, as the existing trade between China and Great Britain, and that an arrangement upon terms of reciprocal advantage will be made by and between His Majesty's Ministers and the Honorable Court of Directors, for transporting, victualling, and accommodating the Chinese passengers. I have already mentioned on the 17th paragraph of this letter, that the government may also look to be remembursed for the advances

that they make by the planters in the West Indies with whom the Chinese may enter into engagements, or by monthly deduction from their wages, a measure which they will, *as a matter of course*, most cheerfully subscribe to.

23. But these suggestions on the mode of reimbursement, however feasible, do not preclude the British government, if they think proper, from granting *extraordinary* indulgences to the Chinese emigrants, and affording them their passage for some years free of expense. I have considered it to be my duty to submit to government the mode of conducting the plan in the most economical manner, more especially as the practise referred to by me, while it will obviate considerable expense, is sanctioned by custom established upwards of two centuries ago, and has never been swerved from.

24. As a direct intercourse between the East Indies and Trinidad, will involve only the expenses of freight, insurance, and interest of capital, the shippers can afford to land goods at rates considerably under what they can do by the circuitous route to Europe, and as the cargoes shipped by the owners of licensed vessels will consist mostly of fine goods, the gruff will be taken thankfully as ballast on account of government. Each ship should therefore be obliged to land such a proportion of gruff supplies for the Chinese colony at determinate rates, as government may deem expedient. Should the supply be found inadequate in the article of rice, ships from America may be allowed to import this grain duty free.

25. As there are no gruff goods to be shipped at China, the license to vessels to trade from that port to Trinidad may be accompanied with the condition of the owners receiving emigrants and Chinese necessaries for the colony, deliverable at certain rates. These articles ought to be shipped according to indents made by the settlers at Trinidad or their Captains and provided under the inspection of the Company's supra-cargoes.

26. The extent, nature and items composing the wants of South America, must be left to experience to determine.

27. The foregoing observations have been principally directed to shew the practicability of effecting the object in view. I have not considered it necessary to take up your Lordship's time with the minutia connected with the management, customs, habits, and religion of the Chinese. Any useful hints that may occur to me on these, or any other subjects connected with this important project, may accompany the Chinese emigrants to Trinidad for the information of the British Agents on the spot, should the general plan be honored with the approbation of government.

In the meantime I shall take measures, in conformity to my instructions, for collecting Chinese at Prince of Wales Island, with a view to the ultimate prosecution of the plan, under the restrictions contained in Mr Secretary Lumsden's letter of the 11th November last.

GEOGRAPHY OF CAMBODIA.

We have lately received the following interesting letter from Monseigneur Miche, Bishop of Dansara, one of the Missionaries of the Propaganda, who have been labouring with so much earnestness and success in the interior of Cambodia. The little map alluded to by Mgr Miche appeared in the number of this Journal for May 1851; and, as stated in the accompanying notes, "was compiled for the purpose of registering some items of geographical information obtained from Constantine Monteiro, a Native Christian in the service of the King of Cambodia, who was sent to this Settlement in July last, to solicit the aid of the authorities in ridding the Cambodian coasts of the pirates who infested them. The positions of many of the places in the interior of Cambodia may probably be incorrect, as they are not fixed by scientific observations, but in the total absence of all authentic information concerning that country, Mr Monteiro's contribution must be considered as a valuable addition to our geographical knowledge of the Indio-Chinese Peninsula."

Cambodia, Feby. 3rd 1832.

Sir,

I received in the course of last year a little map of Cambodia, recently lithographed at Singapore under your direction, after the information of a certain Mr Monteiro, who has the defect of speaking with equal assurance on subjects with which he is, and is not acquainted. Although I have not the honor of being personally known to you, permit me to offer you some rectifications with the view of promoting geographical science to which you are so devoted.

1. The first Cambodian village which figures in the northern part of the map on the right bank of the *Mécon*, the great river which descends from Laos, is Somboc;—but in this there are two errors, for Somboc is situated on the left bank, and lies to the south of Sombor. From Somboc to Sombor, the distance is not more than six leagues. Monteiro has never penetrated thus far. Between Somboc and Sombor the bed of the river is composed of rocks throughout its entire breadth, over which the water is precipitated in cataracts (rapids) thus rendering the river impassable by vessels during the greater part of the year. I ascended this cataract in 1849 and therefore speak from personal knowledge.

2. Bontiai, (this is a Cambodian word signifying "town" but the true Cambodian name is Penompeuk, the Cochin Chinese call it Namvang) is placed in your map far inland to the west of Bati. There is no truth in this. This Bontiai or Penompeuk is situated at the point where the river which descends from the great lake joins the main stream. Bati, on the contrary, is to the south, and lies inland. It is impossible to find a position more

beautiful or more advantageously situated as a place of commerce than that which is occupied by the city of Penompeuk. To the north it communicates with Laos by the Mécon; and to the northwest it has access to all the provinces of Cambodia proper, as well as to those which are subject to Siam, by the river which traverses the Great Lake. To the south, the two rivers before mentioned which unite at Penompeuk, afterwards subdivide into two distinct branches, which open out an easy channel for commercial operations with the whole of lower Cochin China and the Delta of Ancient Cambodia.

3. There is actually a canal from the port of Hatien, (designated in your map by the name of Cancao, which is further to the south) to Mot Kruk, a Cambodian name, which has been replaced by that of Chau Doc by the Cochin Chinese:—it is now the capital of the province of Angiang. This canal is the only passage by which the river which descends from Penompeuk can be reached from Hatien, and consequently the pretended river, the course of which is indicated to the north of the canal, and which disembogues at Hatien, has no existence. The said canal is situated within the Cochin Chinese territories, and as the Cambodians are not allowed the right of passage through it, all commerce with the exterior is impossible.

4. In the explanatory notes which accompany the chart of Cambodia, the port of Cochien is briefly spoken of, which is described as a pretty good anchorage. This might have been the case formerly, but now, if a little schooner of 25 or 30 tons were to set out with these incorrect data, for the purpose of resorting to Cochien, she would infallibly be wrecked, as the road is filled with sand, which is incessantly brought down by the great river of Laos, so much so that even the small vessels of the Cochin Chinese do not venture there. They have also removed the Custom House which was established there, owing to its having become useless.

I will not expatiate here on the respective distances in latitude and longitude between the different cities laid down in your chart, in which as many errors could be pointed out as there are places, but were I to attempt to correct these errors, I should expose myself to commit others ; as in this matter, to be exact, it is necessary to be provided with the instruments which science places in the hands of geographers, for without these, the traveller can only give approximative positions. But Mr Monteiro has not given you even approximative positions, of which it will suffice to give you only one example, which I take by chance. In the map he places the Royal Residence in the same latitude with Chalong, which is situated on the left bank of the great river. There is so little truth in this, that one reaches Penompeuk from the Royal Residence in 5 hours, while the journey from Chalong to Penompeuk occupies 4 or 5 days, yet the direction of these places with reference to each other is such that the difference of longitude made is not greater on proceeding to one than to the other.

Pardon me, Sir, if I have allowed myself to correct several inexactitudes which are in no way attributable to you. In publishing this map you have been actuated only by a desire to render yourself useful, and believe me this letter has been dictated by a motive equally pure.

Accept the assurance of the distinguished consideration with which I have the honor to be, Sir,

Your most devoted,

† J. C. Miche, Ev. de Dansara.

Our correspondent can scarcely have perused with attention the notes which accompanied the little map, or rather sketch, to which he alludes, or he would have perceived that it was not put forth as a perfect map of Cambodia, but rather to show how small was the amount of authentic information we possessed concerning one of the most fertile countries of Eastern Asia, and how acceptable would be the contributions of travellers who like Monseigneur Miche could bring a liberal education to aid their geographical researches. And we are happy to say that our call, for such it was, has been well responded to, as may be seen from the contributions which have already appeared in this journal.

In justice to Constantine Monteiro, we feel bound to state, that his information was furnished at our request and given with a candour and modesty which were calculated to produce a strong impression in his favour, and this impression has been confirmed by the reports of gentlemen who have travelled with him in Cambodia, where he holds a high position in the estimation of the King, by whom he seems to be employed as a commissioner to visit the different provinces to settle differences and report their condition. His journeys from town to town are generally performed on elephants, (the rivers being in the possession of the Cochin Chinese) a mode of travelling unfavorable for tracing a labyrinth of rivers and water courses, so that Monseigneur Miche's corrections which are confined to the Cochin Chinese portion of the Peninsula, are probably founded on better data. But on the other hand, Mr Helms, who visited the Royal Residence in the course of last year, and a narrative of whose journey appeard in the number of this Journal for July last (Vol. V. p. 434) found that its position in the map was correct, and that Mr Monteiro's sources of information were of the best description.

Monseigneur Miche in his letter alludes to an ascent of the river Mécon which he made in 1849, and he has given a very interesting account of his journey in a letter which appeared in the *Annales de la Propagation de la Foi* for March 1851. We subjoin a translation of his narrative, which we have no doubt will be received as an acceptable contribution to our knowledge of this little known region:

I set out from Pinta-lu on the 12th February, and arrived on the 16th at the mouth of the river Chilang, which has its source in the mountains of Nuoi-stieng and which falls into the Mécon about 11° 40′ North Latitude. My principal object was to ascend this river as far as the wild tribes, but to my great disappointment I found the bed of the torrent so dry that it was impracticable even for boats of the smallest size. The way by the Chilang being thus closed to me, I resolved to follow up the Mécon as far as I found it navigable. Knowing that the further I went towards the north the easier I would find it to realize my design, I continued my route to the province of Conchor, from thence I went to that of Créché, then to that of Sambor, where I was obliged to remain for some days waiting for the governor of the province, who was absent, and whose assistance was indispensable to my further progress. I had arrived at the pillars of Hercules, the navigators of the country dared not to venture further, because the river was filled with reefs and everywhere presented great dangers.

I was, however, extremely desirous not to stop here, for two reasons: in the first place, I was only two days journey from the province of Samboc, to which M. Levavasseur penetrated about 1770, and where he built a small chapel. I felt a strong desire to question the old people there about this chapel and the results of the expedition of this zealous missionary. In the second place, I proposed to visit the first Laos tribes, who bordered on the limits of Samboc. Many difficulties however required to be overcome. All the Cambojans who saw my boat told me it would be necessary to turn back again, or to embark with five or six men in a small canoe, in order to continue my journey across rocks and to surmount the cataract from which I was only distant about two leagues. I could not with prudence resolve upon the last, as I could scarcely hope to pass four entire days in a canoe, exposed to a burning sun and the damp cold of the night, deprived of rest and sleep, without falling sick. I caused the two guides who had been furnished to me by the Governor to examine my boat, showing them that it only contained two bags of rice and a little dried fish, that it scarcely drew a foot of water, and that I proposed to take out the mast and sail to lighten it still more. This being done, my guides told me that they could slide over the rocks and surmount the fall without much difficulty, and we took our departure. The oar was nearly useless. My people provided themselves with poles, by the aid of which they struggled against the current and avoided the visible and invisible rocks. Thanks to the transparency of the water, the danger was always noticed in time, and if sometimes our boat ran upon a reef, as we were going against the stream, she only grounded slightly and was very easily got afloat again.

On our arrival at the foot of the cataract we found a reinforcement; the chief functionary of Sambor had gone by land with one of his officers, and waited for us there to give us assistance. I place this fall very near 12° 40′ of north latitude. The bed of the Mécon here enlarges itself considerably and may be about one league from one bank to the other. The waters thus spread over such a large surface offer little depth. All is picturesque in this place; a number of islets, crowned with green thickets, occupy all the breadth of the river for an extent of twenty or thirty minutes. It may be called a forest placed in the water. The latter is only visible at intervals, but the noise of the waves, which break with violence upon the rocks, reveals it at a distance. These islands, intersected by a number of channels, form an inextricable labyrinth to any one who is not accustomed to the place. My people chose the deepest channel. We had before us a magnificent sheet of water, of a dazzling whiteness, which rolled its foaming waves over a stony and greatly inclined bed.

The poles with which we were provided were here useless, and my people plunged into the water. Four of them hauled at the head of the boat, and the other four pushed it from behind. I only remained on board, as I would have been of very little use in the water; for even my Cambojans, although clinging to the boat and with feet much less tender than mine, could not keep themselves upright amongst the sharp stones with which the bed of the river is strewn. When pain forced them to quicken their pace, they slipped over the rocks, falling into the holes, and the boat deprived of their help, was driven back at the will of the current. At length, after an hour's labour and perseverence, we reached the summit of the fall. Our course continued all the rest of the day through islets, which hindered us from seeing more than 30 paces before us. Sometimes we went forward, sometimes we were stopped by barriers of granite which formed a rampart seemingly without any outlet, and obliged us to retrace our steps and seek at random for another passage.

The night surprised us in these solitudes. We passed it very tranquilly upon a bank of sand, where we were awakened at sunrise by the cries of crocodiles which abound in these parts. On the morning of the following day we issued from this labyrinth, and the river lay before us in all its breadth, but more encumbered with rocks than ever. From a distance, they had the appearance of an army of soldiers immersed to the neck in the water. We proceeded on our journey leisurely, and reached Samboc in the afternoon. Since leaving Sambor we have made a distance of about four leagues, in the space of thirty-six hours.

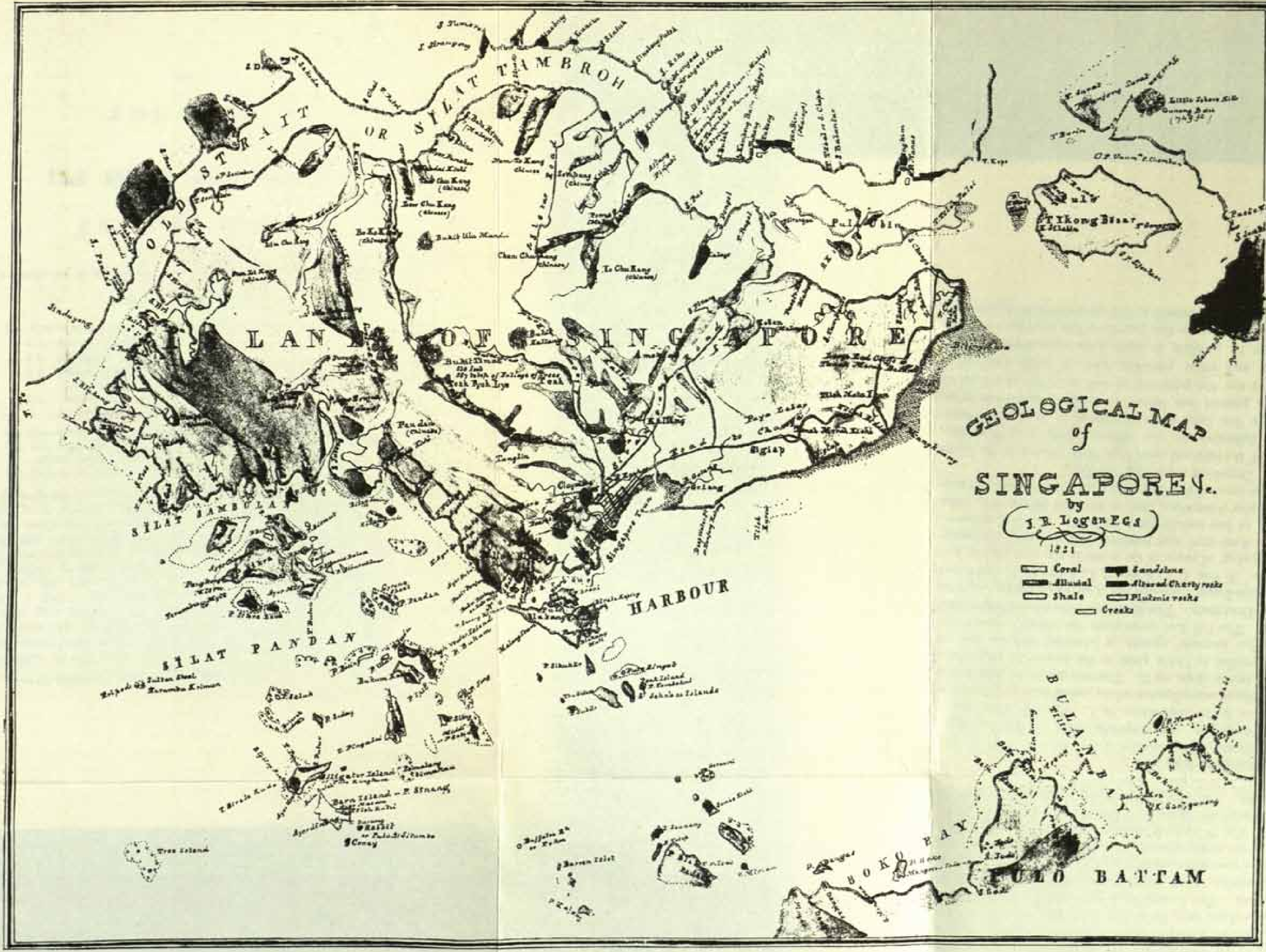
At Samboc there is a governor of the province, but alas! what a province. It is composed of four or five small villages of only about 150 persons each. This country was formerly the richest part of Cambodia, but now it is the most desolate. At the time of the last war, the Siamese general, after having put the Cochin Chinese to flight, seized six thousand Cambojans who inhabited this country and transfered them to Bangkok. At present we only find at Samboc persons very recently established there and I could gain no information regarding the Christian church formerly erected in this village. I believe Samboc to be placed in the latitude of *Cua da-ran* of Phu-yen. The kingdom of Cambodia terminates here on the east bank of the Mécon.

During the rainy season, that is to say in September and October, all the difficulties of which I have spoken above disappear. At that time each river, each canal, which discharges itself into the large river, is accessible to all kinds of boats. We can then reach the wild tribes either by Chilang or by Chlong. Going further up, the rocks disappear under the inundation to a great depth, henceforth there is neither rapid nor cataract, because the level is re-established between the upper and under course of the Mécon. All the persons whom I consulted affirmed that at this time it was easy to go from Nam-vang to Laos in nineteen hours, and to proceed under sail all the way without danger from a single reef.

From the borders of Chilang to Samboc, I found throughout small villages, the inhabitants of which belonged to four different nations, Malays, Chiampas, Chinese and Cambojans, living mixed up together. The Malays and Chiampas are Mahomedans.

On my return to Thmacré, a little hamlet situated half a league to the south of Samboc, I learned that there were some wild people at a short distance. I proceeded to the village where they resided, and which is known under the name of Calop. I found Cambojans as well as wild people here. Most of the latter spoke the Cambojan language. Packed in small huts, they offered a spectacle of the greatest wretchedness, having scarcely a rag of clothing to cover them.

All the women wore necklaces of glass beads and bracelets of brass-wire. I saw one whose arm was entirely covered with one of these spirally rolled bracelets; it was like the sleeve of a dress. The arm charged with such a weight had become useless, and was supported upon a bambu. Both men and women had the hair long, and as it is never combed except with the five fingers of the hand, it may be easily imagined what elegance this long head of hair adds to their person, already very far from pleasing. Further, their ears are pierced and have a large tube of bambu or a piece of ivory stuck in them, which makes them hang down to their shoulders. As to morality, it would be difficult to speak correctly upon the point without a more extended acquaintance with them. On this head, nevertheless, I may remark that their habitual wretchedness, their manner of living and above all the absence of all religious principle, ought to make these wild people very corrupt. It appeared to me from the conversation I had with them that they were not addicted to a single kind of superstition, a thing difficult of believe.


GEOLOGICAL MAP of SINGAPORE &c.
by J. R. Logan F.G.S.
1851
Coral
Alluvial
Shale
Sandstone
Altered Cherty rocks
Plutonic rocks
Creeks
OLD STRAIT OR SILAT TAMBROH
ISLAND OF SINGAPORE
HARBOUR
SILAT SAMBULAN
SILAT PANDAN
Pulo Ubin
Pulo Tikong Besar
Little Johore Hills
BULAN BAY
BOKO BAY
PULO BATTAM
Singapore Town
Bukit Timah
Pandan
Tanglin
Kallang
Rochore
Geylang
Bigiap
Paya Lebar
Bukit Ulu Mandi
Chan Chu Kang (Chinese)
Lo Chu Kang (Chinese)
Sembawang
Tree Island
Barren Islet
Alligator Island
Barn Island
Coney
Buffalo Rock
St. John's Islands
Peak Island
Harbour Rock
Kapal
P. Bukom
P. Brani
Teluk Blanga
Tanjong Katong
Changi

THE

JOURNAL

OF

THE INDIAN ARCHIPELAGO

AND

EASTERN ASIA.

NOTICES OF THE GEOLOGY OF THE STRAITS OF SINGAPORE.[*]

By J. R. LOGAN F. G. S.

- I. STRUCTURE AND COMPOSITION OF THE DISTRICT.
  - § 1. *General Configuration.*
  - § 2. *Geological Topography.*
  - § 3. *Character and Extent of each kind of Rock.*
    - 1. Sedimentary, 2. Plutonic, 3. Ferruginous, 4. Alluvial.
  - § 4. *Structure and Disposition in the Mass.*
    - 1. Sedimentary Rocks, 2. Plutonic Rocks.
- II. METEOROLOGICAL AND HYDROLOGICAL INFLUENCES.
- III. RELATION OF THE ROCKS TO ANIMAL AND VEGETABLE LIFE AND THEIR ECONOMICAL USES.
- IV. TRACES OF THE GEOLOGICAL HISTORY OF THE DISTRICT.

Introduction.—Under this name I shall describe not only the rocks in the Straits of Singapore and along its shores, but also all those comprehended within a rhomboidal space, about sixty miles long and thirty miles broad, of which the northern boundary is a line stretching E. by N. across the Malay Peninsula, from the Straits of Malacca to the China Sea, and touching the most northerly part of the Old Strait of Singapore; the southern boundary being a line in the same direction, touching the most southerly part of Tilo' Sumpat, on the north coast of Bintang, and stretching across that island and all those west of it to Phillip's Channel. The investigation of the geology of the Malay Peninsula could not begin at any other place so favourable for observation, for instead of the dense jungle which everywhere else obstructs our progress and hides the nature of the ground, the whole breadth of the Peninsula is here depressed and broken up, exposing natural sections in various directions, which are preserved from the obliterating influence of the rapid decomposition and exuberant vegetation of the region by the strong currents which the China Sea, on the E., and the Bay of Bengal, on the W., impel through the depression. Of these littoral sections the best are those of the islets in the Straits of Singapore, and the points of Singapore Island, the S. E. promontory of the Peninsula, Bintang, and Batam, which advance into it, and, receiving the full force of the main current, are worn by more powerful waves than those which invade the sheltered portions of the Straits, such as the narrow channel which separates Singapore from the continent, and the shallow bays of Batam.

---

[*] From the Quarterly Journal of the Geological Society.

I. STRUCTURE AND COMPOSITION OF THE DISTRICT.

SEC. 1. *General Configuration.*

The configuration of the district presents several features worthy of remark. The land-portion of it is low, and is composed of hills generally in ramified systems, the direction of the principal branches forming a small angle with that of the geographical axis of the Peninsula (N. W. by N., S. E. by S.) that is, deviating about 20° or 25° to the W. of it, or from N. W. by W. to N.W. by W. ½ W.[*] The mean height of the hills must be under 100 feet, the greater number falling short of that elevation, while only a few points attain to heights varying from 500 to 750 feet[†]. The ranges and branches of hills are always narrow and separated by depressions, which form salt-water creeks at their mouths and flat alluvial valleys towards the interior. A subsidence of a few feet would submerge these depressions and restore the original outline of the land,—a system of narrow, elongated, branching peninsulas, alternately swelling and contracting, the several ranges

---

[*] This direction, however, agrees with that of the whole western side at least of Johor, the Peninsular coast from the latitude of Pulo Lumut, a little to the north of Parcelar Hill, running S. E. by E. to its south-western extremity at Tanjong Buru, a distance of about 160 miles.

[†] The following are the heights of the principal eminences of the ranges in the neighbourhood of Singapore Town, above the level of low-water, at spring tides, as determined trigonometrically by J. T. Thomson, Esq.

	Feet.		Feet.
Lessuden	72·3	Mount Elizabeth	82·2
Mount Erskine	88·3	Cairn Hill	113·2
Ansersab's Hill, or Mount Wallich	144·3	Emerald Hill	71·9
Mount Parsee or Palmer	119·3	Mount Emily	135·1
Duxton	68·2	——— Caroline	108·1
Craighall	65·0	——— Louisa	112·1
Guthrie's Hill	106·2	——— Sophia	108·3
Raeburn	45·2	Bukit Chermin	106·6
Everton	34·2	Hooden Field	70·2
Spottiswoode Park	73·5	Saint James	54·3

and branches always tending to a parallelism with the axis of the mainland. Singapore, for instance (excluding the western triangular portion, which is nearly separated from it by the inlets of the Pandan and the Kranji and forms a curious peninsula by itself), would then present five peninsulas running from N. W. by W., where they are connected, to the S. E. by E. for about six miles, when the four to the west would be cut off along a line nearly N. by E.; while the broadest and most easterly would continue its course in the direction of Tanah Merah Besar, sending off branches to the north-east and forming the bulk of the eastern division of the island.*

The general direction of the Strait is transverse to that of the hill-ranges, but forms an acute angle with it. In reality, however, the Strait consists of a succession of depressions, each of which nearly coincides in direction with the axes of elevation of the land. The most western of these, about 22 miles long (N. W. to S. E.) and 18 miles broad, stretches from the south-west promontory of the Peninsula to the northern islands of the Bulan

	Feet		Feet.
Line Hill..	124·2	Monastery..	72·5
Mount Farquhar..	107·3	Mount D'Aiguilar, south...	80 6
Rosemary Hill..	115·9	————, north....	75.5
Sisters Caroline & Catherine Hill	110·1	Bain's Hill..	78·6
Sri Menanti..	81·5	Briars..	91.3
Mount Harriet..	103·5	Swiss Cottage..	80·5
Nassim's Fine Hill..	93.6	Mount Helen..	80·8
Broad Field..	75·3	Mount Arthur..	80·0
Bonny Grass.	85·5	Dunearn..	75·5
Annan Bank..	80·5	Green Hill..	87·8
Pavilion..	108·3	Mount Faber..	300·7
Kiltiney House..	94·4	Hill in front of Mount Faber..	265·4
Perth Hill..	82·2	Red Hill..	112·0
Kaynan's Hill..	98·7	Ulong's Hill..	129·3
Whampoa's Hill..	93·0	Mount Zion..	45·4
Monk's Hill..	78·4	Peak Island..	101·4
Draycott..	84·2	St. John's..	189·8
Sheriff's Hill, Sri Menanti....	82·2	Blakang Mati large Hill, or Bukit Serapong..	301·7
Sri Tanglin..	86·5	Blakang Mati little Hill	202 9
Mount Mary..	102·7	Pulo Brani Hill..	161·5
Angus Back Hill..	129·4	Bukit Timah..	519·1
Angus House..	69.4	Hill behind Green Hill	124·5
Pearl's Hill..	170,9	Claymore Chinese Burying Ground..	74.5
Institution Hill..	121·9	Hannifarshah's House	71·2
Government Hill..	156·5		
Lady Hill..	108·0		
Mount Victoria..	100 8		

The elevations of some other hills have been determined also by Mr Thomson:—

		Feet.
On the mainland—	Gunong Pau....	749
	Marbukit......	661
	Bukit Santi.....	645
On Pulo Bentan (Bintang Island)—	Gunong Bentan.	1212
	Bukit Kijang...	759

---

* The map shows the configuration of this part of the island well. All the portions represented there as alluvial are flat, and have been silted up in recent periods.

Archipelago, and is bounded on the east by the western coast of Singapore and the chain of islets which stretch from its extremity across the Strait to the N. W. point of Batam. The second basin lies between the S. E. coast of Singapore and the N. coast of Batam, both of which it deeply penetrates; the former in the alluvial plain forming the districts of Rochor, Gelang, Kalang, Paya Lebar, and Siglap, with its long branches or inlets, extending between the hill-ranges to the middle of the island; and the latter in Batam and Bulan Bays[*]. Its greatest length, from the extremity of Batam Bay to that of the Singapore Plain, is about 15 miles[†]; its least, from Tanjong Siglap to Tanjong Singkwang, about 8¾ miles; its breadth is nearly 10 miles. The third basin is the middle of a prolonged submarine valley which stretches northward into the Peninsula, where it forms the estuary of the River Johor; on the south it penetrates the Johor Archipelago, where it forms the Strait of Rhio separating Batam from Bintang. The fourth or most easterly basin,—about 18 miles long, 20 miles broad at its two extremities, and 14 miles in its middle,—lies between the south coast of the S. E. promontory of the Peninsula and the N. coast of Bintang.

SEC. 2. *Geological Topography.*

In giving a general sketch of the geology we shall consider the district as divided into four zones nearly corresponding with the four basins of the Strait.

1*st Zone.*—The first, or most westerly basin, has on its southern side a deep channel, free from islands, which opens into the second basin between Pulo Sambo Kichi and Pulo Sikijang. To the south of this channel a dense clump of islands commences, which stretches to the S. E., and includes Bulan with its conspicuous peak, from which the Dutch hydrographers have named the group the Bulan Archipelago. It remains to this day unsurveyed and unexplored either by the Dutch or English, and in some charts still figures as one island although it must consist of several scores.[‡] It is separated by a narrow channel, called Silat Batu Haji, from the west coast of Batam, which has a general direction coinciding with that of this basin. The northern part of the basin is shallow and contains numerous islands; and the same configuration is continued in the western section of Singapore, which is a congeries of narrow peninsulas, separated by mangrove creeks. The prolongation of the zone in the mainland, including the S. W. promontory, is flat and alluvial towards the W., and hilly towards the E.

[*] These bays are deeper than they appear on the map, and the numerous creeks and inlets which pierce the island between the hill-ranges are not laid down, no survey of the bays having been yet made.

[†] About twenty-one miles, if we include the valleys which have been inlets of the sea since the land attained its present level.

[‡] I have examined the northern part, where I found a perfect labyrinth of islets.

The whole of this zone consists of stratified sedimentary rocks, sandstone appearing to predominate towards the west, and sandstone and conglomerate, intermixed with clay and shale, towards the middle. Towards the eastern side, a broad band, of shale chiefly chocolate-coloured, occurs; and in the extreme east, where it abuts on the syenite of the 2nd zone, this shale is interstratified with sandstone and conglomerate.

The western portion is nearly all covered by the sea or alluvium, the only islands, except those belonging to Bulan Archipelago, being Pulo Rungkum (Alligator I.), Pulo Sinang (Barn I.), Situmbu Kichi and Bĕsar (Rabbit and Coney I.), all of which appear to consist of sandstone and shale.

In the next parallel to the east we find in Pulo Salu' strata of claystone and chert, highly indurated, crystalline, fissile, bluish, greenish, and greyish; soft clay; quartz-veins; quartzo-ferruginous walls; a subcrystalline grit of a granitiform aspect and in some places with a greenish base;—between Salu' and P. Sudong, reefs of iron-rock*;—in P. Kapal, fine, purplish clay; steatitic clay, indurated, white, with seams and walls of iron-rock; fine shale, indurated, purple;—in P.Piel Ayĕm, soap-stone of variable purity, indurated, coarsely foliated; hard steatite; iron-rock in seams and veins; the steatite at some places containing iron-pyrites, and locally iron-masked and cellular;—in P. Blakang Padang, coarse conglomerate, some of the pebbles of which are steatite, either pure or imbedding small quartz-grains; finer beds with much steatitic clay, generally of a light greenish colour, occasionally violet and red; broad beds of fine-grained sandy marl.

Returning to the north, we have in P. Marambong clay with quartz and iron-rock remarkably developed;—in the north-west division of Singapore at Tanjong Gul, clay, fine (as at Marambong), with quartzo-ferruginous walls; at P. Sambulân and Tanjong Kling, clays traversed by ferruginous and jaspideous walls; much laterite-gravel;—at P. Dammar laterite soil, gravel, and fragments; the coast of Singapore facing it is lateritic; on the west bank of the mouth of the Jurong clays and sandy marl; iron-rock swelling up through it in mammillary and botryoidal bosses; ferruginous and jaspideous walls; large laterite blocks composed of small pebbles and fragments cemented together.

Following this band of strata to the S. E., we observe in the Sikra Islands clays chiefly, with ferruginous walls; in Sikra Laut numerous highly indurated, ramifying, mammilated, iron-walls; radiating and concentric laminæ of colour; thin beds of bluish-black and greenish clays. These rocks are continued across to the Old Strait. In P. Busong we find indurated sandstones and clays with irregular ferruginous walls; reticulations of quartz-veins; much disturbance of stratification; in P. Bukum, clay with indurated walls; light chocolate-coloured clay; laminæ of colour;—in P. Simakau and P. Sikiang, iron-rock; hard laterite; —in P. Jong, clay, white with a faint green tinge; a few conglomerate-beds; numerous iron-walls; concentric and radiating laminæ of colour highly developed;—in P. Sabaru conglomerate, sandstone, clay; numerous iron-dykes and laminæ of colour as in P. Jong.

---

* This term is used for brevity in this general sketch. The most common form is the hydrous peroxide of iron; and the iron-rock throughout the district, I shall afterwards show, is the common rock of each particular situs disguised by a greater or less injection of iron.

The next parallel is composed chiefly of sandstone and conglomerate, but with intervening beds of clay, mostly chocolate and purplish. At particular places much iron-rock occurs, and ferruginous lamination is frequent, although not on the great scale of the Sabaru group. The principal exhibition of this band is in the high range of hills on the S. W. coast of Singapore, stretching from Suñgĕi Pandan to Batu Blyĕr (where the highest sea-cliffs in the district occur), and continued in the island of Blakang Mati. Proceeding along the same line of elevation to the S. E., we find it again in P. Sikukur, the two Sikijangs and Subar. It reappears on the other side of the Strait, and on the same line, in the two Sambos (where we find sandstone, grit, and conglomerate, for the most part highly indurated and semi-crystalline; clay, chocolate, light purplish, violet, greenish, and yellow; and iron-rock), P. Miriam and the eastern portion of the N. W. point of Batam.

To the east of this line the chocolate and violet clays, which have hitherto either shown themselves as isolated beds or in narrow bands amongst the other strata, became continuous, occupying a breadth of about one mile and stretching right across Singapore in the direction of N. W. by W. This band includes P. Brani and the eastern portion of Blakang Mati, in both of which the colours vary much,—chocolate, purplish, different tints of violet, greyish, lilac, green—and in which sandstone-layers are intercalated. It is then lost for about six miles in the Strait, but is found again on the east side of Sambo Kichi and on the coast of Batam, at Pulo and Tanjong Dañgas.

2nd zone.—The second zone consists almost wholly of soft amorphous clay and sandstone with conglomerate; the latter, however, containing a good deal of clay either mixed with it or in separate beds. The clay in Singapore forms a compact tract of about sixty square miles, occupying the main body of the island[*]. On the south it is separated from the plain of Singapore by a narrow margin of sandstone, and then stretches across the island in a N. by E. direction to the Old Strait. On the west its boundary runs in a north-westerly line, nearly parallel to the chocolate clay band, for about eight miles, when it is deflected towards the N. in the direction of S. Kranji, in the vicinity of which it meets the Old Strait. In Bukit Timah, solid greenish granite and syenite, passing in some places into compact laminated felspar, are seen. On some of the other hills of the clay-tract, protruding blocks of syenite and granite are occasionally found. Where deep sections have been made through the clay, its structure and composition are found precisely to resemble those of adjacent blocks, while on the surface it has a remarkable uniformity of character,* and is easily distinguished from the sedimentary clays. The whole of this tract, therefore, is decomposed plutonic rock. The clay in some places, and particularly in the bottoms of valleys, where it is covered by vegetable mud and has undergone a natural bleaching, is a pure white kaolin, but it generally imbeds quartz-granules (in rare cases abundantly), and a few feet below the surface is mottled with red in various degrees, in isolated or connected ramifying blotches or in parallel curvilinear streaks. Fresh sections exhibit various tints of red, lilac, purple, yellow, &c. Pure white streaks and zones also occur frequently, exhibiting a kind of irregular, broken reticulation. It is sometimes altogether of a dark red hue. When this is the cases, masses of a half-decomposed iron-rock are generally found in it; and in most localities, where cuttings have been made, a similar rock occurs here and there in dykes and ramifying veins. On the sides of these veins laminæ of a red colour are sometimes seen, either parallel to the vein, radiating from points in it, or forming systems of concentric lines. The iron-rock is also found either strewed over the surface in amorphous cellular blocks and small pebbles, or below the surface, at depths varying from a few inches to a few feet, in layers of similar pebbles. With these pebbles others of jaspideous and porcellanous rock are frequently intermixed, and veins or strings of the latter are found in the deeper sections or in the half-decomposed crumbling granite which in a few localities is exposed at the surface. In some places patches of a visicular jaspideous rock are frequent in the decomposed mass. These are sometimes considerably ferruginous. Fragments of semi-decomposed syenite and granite, ferruginous in different degrees, are common. When highly ferruginous, they are more or less visicular, and the only unchanged constituent of the solid rock is the quartz. Even this is sometimes penetrated by the iron. The upper soil, or that which has been completely subjected to atmospherical action, is a clay with a greasy lustre, but often inclining to a dry friable appearance, in colour generally yellowish brown, but with lighter and darker hues in particular localities. In many hills it it highly ferruginous and of a deep red colour. This, with the smaller proportion of quartz, distinguishes it from the granitic clays of Pinang higher up on the west coast.

---

[*] It is almost a square of eight miles, coinciding with the Peninsular axis; that is, two of its sides run N. W. by W. (the northern of the two giving its direction to the Old Strait from T. Pongal to S. Tambrau), and the other two sides running N. E. by N. (the northern of the two giving its direction to the Old Strait from S. Sinoko to the creek of S. Batang Hari, and the southern giving its direction to the ancient W. coast of Singapore Bay.)

---

* The variable proportions of iron and quartz, however, affect this character.

The easily accessible localities where ferruginous blocks are most exposed are the hills along the boundary between the plutonic and sedimentary tracts near Singapore Town, such as Mount Victoria, Sri Menanti, the hills connecting it with Mount Zion, the hill forming the extreme S. W. point of the granitic tract, the western hill of Dr Oxley's nutmeg-plantation, Cairn Hill, the coast of the mainland from Tanjong Tanguloh to Pulo Nanas (at Tanjong Passier Mera and near S. Tukong, &c.

The sandstone and shale surround the plutonic tract on the W. and S., being found occupying the space to the N. W. of it up to the Old Strait, rising in the hills near Singapore Town to the S. E. of it, and, lastly, forming, with a great predominance of sandstone, grit, and conglomerate, all the eastern portion of the island, with the exception of the hills at Chang̃ĕi. At several places there is much ferruginous rock, as in the hills running south from the Mosque in the town to Tanjong Malang, and continued in the reefs off that point. On the opposite site of the flat of the Singapore River, and where the very same line, prolonged to the north, crosses the two bifurcations of the Tanglin Range, we find a considerable development of laterite-rock in Government Hill, Mount Sophia, and Mount Seligi, where the clay is intercalated amongst the sandstone, which latter is highly indurated.

On the Batam side of the Strait the sandstone is found from Sung̃ei Ledi in Batam Bay to Bulan Bay, and at some places contains iron-rock. The east side of Bulan Bay and the whole N. E. promontory of Batam with Pulo Nongsa is granite, which differs from that of Singapore in colour and in being larger-grained.

3rd zone.—On the east coast of Batam, in contact with the granite, are found iron-rock and clay, and in the granite, iron-dykes containing casts of shells. The third zone includes the island of Pulo Ubin, consisting of various forms of granite and syenite (often approaching to and sometimes passing into greenstone) and remarkable for its tabular and concentrically laminar structure and its extraordinary grooves, resulting from the action of decomposition on its rocks;—the eastern promontory of Singapore has a similar composition; Pulo Nanas or Kirimkin, and the mainland opposite are composed of green-stone-porphyry; the hills on the mainland at Tanjong Tanguloh of decomposed plutonic rock, similar to the prevailing Singapore clay, and, like it, containing ferruginous and jaspideous fragments; the small islets of P. Sijahat and P. Hantu III, consisting of foliated clay-stone and chert, varying from subcrystalline to highly crystalline, generally very hornblendic, and traversed in P. Sijahat by a dyke of greenstone-porphyry; Pulo Tĭkong Bĕsar and Pulo Tĭkong Kichi are chiefly sandstone, highly indurated, and with iron-rock; in the sea off the S. W. point of Tĭkong Bĕsar rocks of granite occur, called Batu Kapala Tua[*]; Marbukĭt (Johōr Hill) is composed of clays and conglomerates, indurated, passing into crystalline chert, &c., and of quartz and iron-rock;—the coast of Bintang, from Tanjong Kalumpong to Tanjong Subong, is probably granitic.

4th zone.—In the fourth zone we find on the east bank of the Johōr River, at Johōr Lama[†], granite; to the south of it, grit and conglomerate, from Tanjong Sladeng to Tana Runtu (in the conglomerate of which fragments, partially decomposed, of chloritic granite, some very little rounded, are found), and probably as far as Tanjong Boe; in Gunong Bău and the lower hills behind it on the S. Karang, green-stone, varying from compact to granular, the latter approaching the fine-grained granites of Pulo Ubin; along the south coast of the S. E. promontory of the Peninsula at Tanjong Tiram greenstone-prophyry; at T. Telumpong, granite; at Tanjong and Pulo Rumnia, shales, further to the E. passing into subcrystalline rocks; at T. Penyusoh (Point Romania), Peak rock, South Island, and Pedro Branco (not included in the map), syenite; North Rock, shale; along the east coast, facing the China Sea, at Tanjong Puñgai and Tanjong Kinawar, talcose sandstone and shale, sometimes semi-crystallized, with abundance of iron-rock in large rounded shining blocks, and quartz[‡];—at Tanjong Lompatan, talcose shale, quartz, and iron-rock;—along the north coast of Bintang, from Tanjong Subong to the N. E. Point, syenite[§]; at the Point, talcose clay and shale with iron-rock,[‖] and quartz (similar to T. Kinawar.[¶]

SEC. 3. *Character and Extent of each kind of rock.*

1. *The Sedimentary Rocks.*—Viewing the district as a whole, we observe that amongst the sedimentary rocks the shales greatly predominate, the chocolate and purplish being the most common.

---

[*] J. T. Thomson, Esq.

[†] This Bugis town is further north than the map extends.

[‡] See my "Notices of the Geology of the East Coast of Johore." Journ. Ind. Arch. vol. ii. p. 625

[§] J. T. Thomson, Esq.

[‖] Mr Thomson says, that "Laterite in a fused state appears to have run into and over this stratum in several places so as to crack it."

The lava-like appearance of the hydrous peroxide of iron here and in numerous other localities is exceedingly deceptive. I was misled by it for a considerable period, and the views which I have communicated to the Asiatic Society respecting the geology of this region were more or less coloured by this notion. The ejected-fluid-aspect and blackish colours are entirely owing to the peroxidation and concreting process of the iron. Is not the iron-dyke in Mavrospilia, which puzzled M. Virlet d'Aoust (*Expédition Scientifique de Morée*, pp. 54, 55), capable of a similar explanation?

[¶] Specimens from J. T. Thomson, Esq.

The soft shales and clays are of far greater extent than the indurated, and are either quite soft, yielding to the hand, or have various degrees of consistency, up to so much hardness and toughness as to require the hammer to break them. They are in great measure a mixture of clay and fine siliceous granules, to which the term *marl* may be applied, but as descriptive of their consistency only, for none of them are calcareous. Those in which clay is in excess, so as to be completely plastic, are not frequent. The steatite, when it occurs, is generally in large proportion, but of limited extent. I have only observed completely indurated argillaceous and argillosiliceous rocks of a cherty and jaspery nature, and considerable in extent, at Pulo Salu, P. Kapal, P. Piel Ayem, Tanjong Putri (western), Pulo Sijahat, Pulo Hantu III, and Tanjong Pingrang.*

The sandstones and conglomerates are more often indurated than friable. In many cases the former have a subcrystalline texture, and the latter a compact silliceous basis, traversed by veins of quartz-crystals. The most numerous pebbles in the conglomerates, are of a dull whitish quartz. Greyish quartz-pebbles are also common. Black, red, and yellowish pebbles occur sparingly, although in some localities more abundantly than in others. Felspathic pebbles, sometimes with a crystalline, but generally with an earthy fracture, are common, violet tints prevailing. The basis of the conglomerates, when not indurated, varies from clay, often chloritic or steatitic, to a friable earth or marl, sometimes also chloritic, containing an abundance of quartz-granules. The highly indurated and subcrystalline sandstones chiefly occur in Mount Palmer, Government Hill, Mount Sophia, and Mount Siligi in Singapore, and in the promontory terminating at Tanjong Singkwang in Batam.

2. *The Plutonic Rocks.*—Taking a similar broad view of the plutonic portions of the district, the most general character that we observe is the predominance of felspar and the prevalence of hornblende,—quartz and mica being generally in small proportions, and the latter rare. Well-developed granite of the common type is found in very few localities on the northern side of the Straits. The plutonic tract of Singapore being very deficient in quartz and mica, it is probable that most of the red clay hills which occur in it are decomposed greenstones and highly hornblendic syenites. Even Pulo Ubin, although it presents several decidedly granitic bosses, tends, on the whole, more to the felspatho-hornblendic character, which exclusively prevails to the eastward of it, in Pulo Kirimkin (Nanas), the mainland opposite, Pulo Sijahat, Gunong Bau, and the adjacent hills. The only considerable display of proper granite is that on the southern side

---

* P. Pisang (N.W. of P. Kocob, beyond the limits of the map) and the east coast of Krimun Kichi are striking examples of this class of rocks.

of the Strait, in the north east section of Batam and the north of Bintang.*

With respect to the granulation and composition of the plutonic rocks, every variety may be found, from the most compact hornblende and felspar, through granular greenstones, minutely grained greystone, syenite, and eurite, to large-grained granite. In Pulo Ubin we find the following gradations (the hornblende being in general either in nests of small granules mixed with felspar, disseminated in minute particles, or in long thin streaks): light reddish granite, with quartz predominating; granite of a bluish grey tinge; syenite with felspar in excess; syenitic greenstone; greystone; grey felspar, transparent quartz with some black mica interspersed, and nuclei with the mica in excess; a quartzo-felspathic basis (pegmatite) with minute particles of mica and hornblende disseminated, in some places sparingly, in others abundantly, so as, on partial decomposition, to give the rock the appearance of finely-ground pepper; spherical nuclei of mica with a little felspar, surrounded by concentric laminæ; greenish grey saccharoid felspar, with crystals of quartz and nests of mica sparingly disseminated; whitish felspar, black mica, and hornblende; well-crystallized felspar, with dark green hornblende disseminated in granules, cloudy spots, and fibres; blackish greenstone or hornblende rock; felspar and hornblende confusedly aggregated; opake white felspar, tinged green, and blackish green hornblende in very large and distinct granules; very finely grained blackish greenstone approaching to basalt; basalt; opake bluish grey and white saccharoid felspathic and quartzo-felspatic bases, inclosing crystals and grains of hornblende and translucent crystals of felspar (closely resembling one variety of Vesuvian lava), in some places becoming compact, the hornblende granules sometimes so minute as to appear like fine black dust sprinkled on snow; in the group of rocks close to Ubin called S'kodo (from the supposed resemblance of one of the most conspicuous to a frog), there is found a regular large granitic crystallization, the hornblende being in well-defined crystals of various sizes and mostly fibrous.

3. *The Ferruginous Rocks.*—The iron-rock and quartz which are found so generally, and in particular localities so strongly developed, occur occasionally in broad irregular patches and bands, but usually in walls, veins, and seams. Where they are most abundant the principal walls follow the direction of the strata, but are most frequently sinuous, and connected by branches with those adjacent. The beds themselves, in such cases, are generally bent in a similar direction. The sides of the beds, where not obliterated by these walls, are often indurated and acquire a shining mammillated surface. Sandstones are often divided into little

---

* I have not personally examined Bintang.

cubical and rhomboidal compartments, being pervaded by a complete reticulation of a thin black ferruginous crust or wall, which, from the washing-out of the sandstone by the action of the waves, projects, like the sepiments of a honey-comb, from the surface.

In clays and shales (and sometimes in fine-grained sandstones) red-coloured laminæ are frequently seen in connection with the ferruginous walls and veins, and arranged either in lines radiating from points or in concentric curvilinear figures. The most remarkable examples of this laminar coloration occur in the islands of Jong, Sabaru, and Bukum. Another kind of lamination is often seen in ferruginous walls. In this the original laminæ of the rock are preserved, but converted into iron-ore. Sometimes they are swollen into a globular form. This seems to be the origin of most of the mammillated and botryoidal forms.

The associated iron and quartz are found developed on the largest scale at Marambong and Tanjong Kinawar; and more or less quartz is found in almost every highly-ferruginous wall.

The localities where the iron predominates over the quartz are very numerous. Amongst the more striking instances may be mentioned, in sandstones, T. Sirimbun, Mount Palmer, the coast of P. Tĭkong Bĕsar; and in shales and clays, P. Dammar, the coast of Singapore opposite, Tanjong Pĕnjuru, P. Siking, P. Sabaru, the lateritic portion of Government Hill, the north-east part of P. Tĭkong Kichi, and Tanjong Pungăi.

The iron-rock is generally a hydrous peroxide and different forms of brown hæmatite, compact and ochry. In most localities the proportion of iron varies much, and is often too small to entitle the rock to be called an ore, but patches and masses of ore occur abundantly, and some walls are almost wholly composed of it. Regularly crystallized ores are not frequent in considerable patches, but hæmatitic crystals occur in the body of pieces of compact ore; and the thin brownish-black and black ore penetrating ferruginated rocks in seams, forming the external walls or crust of mammillary and botryoidal, and the lining of tubular and cavernous, masses of laterite and iron-masked rocks, is sometimes composed of fine fibrous crystals. I have found large-crystallized hæmatite in ferruginous sandstone and shale near the boundary of the plutonic and sedimentary tracts to the westward of Bukit Timah, and in violet-coloured shale midway between the Chinese Tokong, on the Pandan, and Bukit Timah.

I have already mentioned the mode in which ferruginous rock occurs in the plutonic tract. The following is an analysis, made in England, of a specimen of the common ore of the dykes occuring in this tract.

Peroxide of iron (containing 56 parts of metallic iron	80
Silica, lime, and alumina........................	5
Water..	15

Sp. gr. 3·12.

Pyrites occur very rarely. I have only observed them in a considerable nidus amongst the shale of Pearl's Hill in a mass of anthracite, in steatite at P. Piel Ayém, and in the granite of Pulo Ubin.

4. *Alluvium*—All the valleys are filled up to a greater or less height with alluvium, the bulk of which has been deposited from salt water, the fresh water deposits being generally superficial, although in some places of considerable depth. As this formation, in all its varieties, is still going on before our eyes, I will here mention causes and effects together. It has been remarked, that, when the district attained its present level, the sea must have flowed up the numerous long inlets which everywhere penetrated the land. All the different rock-formations must then have been accessible to the sea. Let us revert to this period in Singapore, where we can easily trace our way back to it. At that time, in crossing from Batu Blyĕr to Tanjong Tanguloh eight arms of the sea had to be passed, each with its shores winding round the point and into the concave recesses of the ramifying ranges which separated them, and receiving from the multitude of hillocks the clay which every shower of rain removed from their surfaces. The whole land was so constructed as to allow the greatest amount of waste to take place under ordinary atmospherical erosion. Scarcely any flat ground existed. Everywhere acclivities rose from the sea only to attain a certain height and be again bent into declivities which sunk into the sea on the other sides. The upper part of the valleys filled rapidly with clay, mud-flats were formed there and along the margins of the inlets, on which the mangrove and other salt-water trees flourished, and by their decay gave a carbonaceous character to the mud. In the shade of these maritime forests the *kapiting* and *udang kiteh*[*] built up their pyramids of mud and helped to elevate and consolidate the floor, while their excrements and remains, with those of numerous crabs and testaceous mollusks, contributed with the vegetable matter to give a new character to the clay. In the meantime the same process went on in the eastern part of the island, but the sediment there was more mixed with sand. The points at the mouths of the inlets along the whole northern coast of the second basin of the Straits then consisted of sedimentary strata, exposed to the action of waves and currents, and those in the east, in particular, formed of yielding sandstone, supplied a large quantity of alluvial matter, while the shales of the hills near the site of Singapore town freely gave their loose red soil to the sea. When the mangrove-marshes, with their mud-flats in front, had gradually approached the mouths of the narrow inlets, a new condition of things arose. The sand,

---

[*] Burrowing crabs. The *udang kiteh* is shaped like a scorpion, and greatly resembles, if it be not identical with, the *Thalassina scorpionoides*.

no longer sinking into deep water beyond the influence of the powerful surface-agitation of the sea, was thrown upon the mud-flats, and, during the north-east monsoons, the heavy waves from the China Sea piled it up in long belts in fronts of the mangroves.

The clayey sediment of the plutonic tract now accumulated more exclusively around the mangroves within these belts. As the sands extended, the waves no longer penetrated into the inlets. In the higher part of the valleys, and in the recesses of the lower parts, the water became brackish, the mangrove and its associates died out, and a new and more exuberant order of vegetation, in which palms and ferns abounded, took their places. A black peaty matter now formed rapidly, filling up all the hollows, spreading over the ancient mud-flats, and burying the remains of the mangrove-forests. The alluvium now advancing beyond the inlets into the gradually shoaling bay of Singapore, the three processes which we have described proceeded for the future simultaneously. One sand-bank after another was thrown up, and the streams from the valleys were deflected into lagoons between them, in which a succession of events analogous to that in the old inlets took place. In the upper part of each successive lagoon were brackish marshes, in which dense forests grew; and in the lower, and along the margins of the creeks as far as the water was salt, the mangroves kept their place, forming with the sand, a barrier against the waves. Bank after bank arose, lagoon after lagoon was formed, until the whole of the ancient bay was converted into a marsh, covered with forest and containing a succession of dry banks of sand or *pérmatangs*, the last of which has formed the present lagoon of the Gelang, projecting its extremity, like a tongue, into the harbour of Singapore at Tanjong Ru (Sandy Point), and has given a common estuary to the streams from every valley that opens into the Singapore plain.

This history I narrate with as much confidence as if there had been human witnesses and chroniclers of its whole progress, because not only has it left its own records of all its stages, but its current events are repetitions of these, and afford the fullest explanation of each of them.[*]

The valleys have now perfectly level surfaces, covered with forest where plantations have not been formed; and the layers of which they are composed are the pure plutonic clay,—a dark bluish marine clay which is seen at the heads of the valleys on both sides of the island up to the foot of Bukit Timah,—a black, soft, vegetable peat, or rather mud, in some places of great depth where hollows have existed,—and sand. The plain consists of the same matter, sand and vegetable mud prevailing towards the surface in all the eastern part, where alone a considerable extent of either is found. The inner part of the plain, before it was cleared and partially drained, formed there a large marsh called Paya Lebar (broad marsh) with a deep bed of black vegetable mud in which a dense forest grew. The outer part, towards the range of sandstone hills forming the eastern margin of the plain, is a sandy flat, which, as it extends to the west, divides into long pĕrmatangs, with flats of clay and vegetable matter between them. The upper or eastern part of these flats often contains a considerable proportion of sand. The more inland banks continue across the inner part of the plain, marking the first continuous coasts of the bay. Others, deflected, in different directions, but generally trending more to the west and to the south of west, traverse the plain; the penultimate one extending along the Chaṅggie road up to Kampong Glam, and the latest forming the present coast terminating at Tanjong Ru. Although the force of the north-east monsoon has laid down the sandy debris of the eastern cliffs in these long pĕrmatangs extending to the western side of the plain, deflected all the eastern streams in the same direction, and is even bending to the west the mouths of the western streams themselves, and driving them all up into the extreme S. W. corner, where there will probably be ultimately but one outlet for all the waters that fall into the harbour, yet there are records of a time when the western side of the plain and the western inlets had their own pĕrmatangs. One of the most distinctly marked runs transversely to these inlets, or from S. W. to N. E., and it must have been formed while the greater part of the plain traversed by the pĕrmatangs from the east was covered by the sea. The only point where the Siglap sandstone-ranges are now wasting is at the Red Cliffs, but the hills stretching to the west of this for about a mile and a half, and gradually retiring from the present line of coast, are sharply scarped at all their points which project on the sandy plain, and the scarping of those forming the S. W. angle of the range was probably coæval with the formation of the pĕrmatang in question.*

---

[*] "The lower parts of the valleys are mostly swampy, consisting of sand, clay, and black peaty mud; of the latter there are considerable tracts constantly moist and exhibiting an extraordinary rankness of vegetation. Looking on one of these swamps, covered with tall but slender trees, and dense underwood growing up rapidly, and from the looseness of the bed of black vegetable matter,—the accumulated remains of their short-lived predecessors—destined soon to fall in their turn, and considering the deposits of clay and sand which accompany and give rise to it, it is impossible to doubt that we see nature repeating the precise process by which the materials of most of the ancient carboniferous strata were brought together. Towards the sea these forest marshes give place to mangrove swamps." *On the Local and Relative Geology of Singapore, including Notices of Sumatra, &c.* (by the Writer) Jour. Beng. Asiatic Society, vol. xvi. p. 525.

Shells are found, often very abundantly, in the alluvial clay.

---

* The pĕrmatangs of Singapore are inferior both in length and elevation to those of the large plain of Province Wellesley, facing Pinang, which have been formed by the waves of the Bay of Bengal. For further information on this subject consult the section headed *Rivers and Alluvial Formations*, in my "Sketch of the Physical Geography and Geology of the Malay Peninsula," Jour. Ind Arch. vol. ii. pp. 116 to 136.

Beds of Coral are also occasionally met with. The infrequency of deep excavations is probably the reason why, in localities inhabited from very ancient times[*], human remains are so seldom brought to light. In the inner part of the Singapore plain a piece of coir-rope was found 6 feet below the surface, and a piece of wood bored through, and having the hole filled with the twisted fibres of a piece of rope, was found in the town of Singapore at a depth of 40 feet. Mr Thomson bored through 10 feet of blue mud and 30 feet of ferruginous earth before this piece of wood was brought up. Other 40 feet of hard ferruginous earth and clays were pierced at this locality (near the Hindu Temple).

At the Gaol, 55 feet of blue mud, mixed with shells, were found resting on red earth mixed with the bark of trees.

At Teluk Ayer, near the beach, the layers bored through were,—

Soft blue mud with shells	40 feet.
Bright red clays alternating with brown and yellow clays	60 „

At the foot of Government Hill, near the Convict Lines, there were found,—

White clays	20 feet.
Red clays and laterite resting on a very hard white clay	30 „

In digging "Tocksing's Well," 9 feet of alluvial sand were found to rest on ferruginous gravel similar to that which occurs frequently on the hills near Singapore.[†]

I have not mentioned Coral as contributing to the alluvium of Singapore plain because there is no evidence that it did so in a considerable degree. The eastern cliffs wasted too rapidly to allow of its growth in front of them, and mud and sand-banks, both unfavourable to the Polyps, were constantly increasing within the bay. The fresh water which it received from the interior would also be hostile to them. I shall at another place notice the localities where they flourish and the office they perform.

SEC. 4. *Structure and Disposition in the Mass of the Rocks.*[‡]

1. *Sedimentary rocks.*—With the exception of the sandstones in the eastern part of Singapore and those on the east bank of the River Johōr below Johōr Lama, which are nearly horizontal, the strata rise at various angles, generally high, and frequently vertical.

---

[*] Jour. Ind. Arch. vol. i. p. 300, 302, and vol. ii. p. 517.

[†] The above paragraph is from the paper cited in the note on p. 193. It is added, on the authority of Dutch writers, that in Banka, which is a part of the Peninsular band of elevation, and where tin pits are often dug to a considerable depth through the alluvium, there has been found a bed of turf, with wood which had been cut, below 20 feet of clay; a boat, differing from the kinds which have been in use from time immemorial, at a depth of 16 feet; and traces of a rice-field in another deep pit.

[‡] I have obtained sections and measurements of the strata of many of the islands, but I reserve these for notices of the islands.

Their strike over the whole district approximates to the direction of the Malay Peninsula, or N. W. by N. It deviates, however, about 22½° on both sides, or to N. by W. and N. W. by W., and this not merely at places distant from each other, but in limited localities.

Strata are very rarely found lying in other quarters of the compass, and such aberrations never extend far. The most striking exceptions are Kiltiney, adjoining Government Hill in Singapore, where the strata run N. N. E., as they also appear to do in the next hill to the west, Institution Hill.

Amongst the most continuous lines that I have observed are that of Bukum, Jong, and Sabaru, nearly N. W. ½ W. throughout; the Batu Blyĕr sandstone-cliffs along a considerable portion of their length; some of the shale-beds extending from Tīloh Blangah and Pulo Brani to Blakang Mati; the most southerly beds of Sikukur which are continued in the West Sikijang. But the greater number of the islands and points, where the stratification can be observed, present irregularities. Thus, to notice the most marked instances, proceeding from north to south, at Marambong we not only find the more ordinary oscillations, such as N.N.W., N. W. ½ N., &c., but bends and curves, so that at some places the beds run N. E. by E., N. N. E., &c. At Busong similar irregularities occur, as we see N.E., N.E. by N., N.N.E., N., N. ½ W., N. N. W. ½ W. At Tanjong Lompatan the strike is N.E., E. by S , &c. The more common variations are such as those of Batu Blyĕr Cliffs, N.N.W., N.W by N., N.W.; Blakang Mati, N.N.W., N. W. ½ W., N. W. by W.; P. Brani, N.N.W., N. W. by N., N.W.; the hills east of the village of Tīloh Blangah, N, by W., N.N.W., N.W. by N.; West Sikijang, N. by N.W., N.N.W., N.W. by N.; East Sikijang, N. by N.W., N.W. ½ W., W. by N.; Tanjong Piñger, N. by W., N.N.W., N.W. by N.; N.W., N.W. by W. at Tanjong Malang; N. W. by W. and N. by W. in Mount Wallich; N. W. by W. and N. W. by N. in Pearl's Hill. The most prevalent strikes recur in almost every locality where the strata are well exposed. N. by W. beds are seen in Sambo Kichi, Tanjong Piñger, Tīloh Blangah, and both Sikijangs, Mount Palmer, Mount Wallich and Tanjong Pagar; N.N.W. in T. Piñger, T. Dañgas, Marambong, Sikra, Batu Blyer, Blakang Mati, Pulo Brani, Tīloh Blangah, Sikukur, West Sikijang, Tanjong Pagar, Tanjong Malang, Government Hill; N. W. by N. in T. Piñger, Batu Blyer, T. Blañgah, P. Brani, and West Sikijang; N.W. in Piel Ayĕm, Tanjong Gul, Batu Blyer, Hodin's Hills, Pulo Hantu II. Panti Chirmin, Pulo Brani, Blakang Mati, Tanjong Malang, the shale beds to the W. of B. Timah and in the east point of Bintang; N.W. ½ W. in Bukum, Jong, B. Blyer, B. Mati, West Sikijang, and Tanjong Puñgai; N. W. by W. in Sabaru, Batu Blyer, Hodin's Hills, T. Blangah, P. Brani, Blakang Mati, Timukul, Mount Wallich, Dickinson's Hill and Pearl's Hill; in the shale-beds between Tilo Blanga and the Sepoy Lines.

The variations in dip, like those of strike, have a general character of uniformity, with considerable occasional deviations. Vertical or approximately vertical strata occur in P. Blakang Padang, Sambo, T. Pinger; P. Busong, Jong, Bukum, the Batu Blyer Range, Hodin's Hills, the N.W. point of P. Blakang Mati, the Tiloh Blangah Hills, Mount Palmer. Oscillations may be observed in Marambong: in Busong; in the Batu Blyer Range of about 70°, or from 25° W.* to vertical and a few degrees from vertical to the E.; in Tanjong Pinger about 75°, or from 20° W. to vertical and a little to the E.; in P. Blakang Mati of about 45°, or from 50° W. to a little E. of vertical; in West Sikijang of about 90°, or from 45° W. to 45° E.; in East Sikijang about 35°, or from 45° to 80° E.; in the range terminating at Tanjong Batu (Singapore) about 85°, or from 50° W. to 45° E.

A high inclination being very common, a decided tendency to a dip in one direction is not to be anticipated. In several localities the rocks dip away from vertical on both sides, indicating the existence of synclinal axes, which in a few instances are seen, as in the N.E. point of Blakang Mati, Mount Palmer, &c. The only distinct anticlinal axis that I have observed is in a hill forming the south point of West Sikijang, where the strata are arched.

Notwithstanding this tendency to verticality, the westerly dip on the whole predominates in the western part of the district, for, although beds having an easterly dip are found in P. Mirambong, P. Blakang Padang, P. Busong, P. Jong, P. Sabaru, the Batu Blyer range, P. Hantu, Blakang Mati, Sikukur, West and East Sikijang, T. Pinger, Mount Wallich, Mount Palmer, Kiltiney Hill &c., and in some cases the dip is exclusively to the east, yet in most of these localities the beds that dip to the east are associated with a greater extent of beds that have a westerly dip. In the eastern part of the district, however, the dip is generally to the eastward, as at the Tikongs, Tanjong Pungai, and the N. E. point of Bintang; but it is not uniformly so, for at Tanjong Lompatan it is about 45° W. In the next considerable exposure of rocks on the east coast, those of Sidili Point, to the north of the district, the dip is again easterly.

The strata, although where iron-rock and quartz occur often much disturbed, and sometimes, in patches, broken up and mixed, forming a hard ferruginous breccia, are nowhere completely shattered, and the fragments confusedly mingled, except in considerable portions of Government Hill, Mount Sophia and Mount Siligi, where no beds are distinguishable, the hard sandstone being scattered through the clay, at some places in angular blocks from a few inches to several feet in diameter, and in others as a fine breccia.

---

* W. and E. are here used for westerly and easterly.

2. *The Plutonic rocks.*—The prevalence of felspar and hornblende renders these rocks very decomposable when kept exposed to the influence of water under ground. Hence while blocks rising above the soil suffer little waste, the mass below is almost everywhere converted into clay to a considerable but unknown depth. The only locality in the district where rocks have escaped decomposition in sufficient number and size to display their structure is Pulo Ubin. This has probably been owing to the steepness and narrowness of the range of which it consists, and the action of the sea along both its sides, which have combined to degrade and wash away the decomposed portions, thus leaving the more resistent masses to emerge from the soil and stand out above the influence of decomposition.*

All the numerous exposed blocks of Pulo Ubin have a large laminar or zoned structure. The laminæ are in different forms, flat, spherical and concentric, or variously curved; but the systems of circles and curves seen in horizontal sections are generally portions of a connected system, of which the external laminæ are rectilinear, or nearly so. The principal rectilinear planes of division approximate in their general direction to N. E. . . . S.W., or at right angles to the axis of elevation of the region.

Transverse and approximately horizontal planes of division exist, so that the rock tends everywhere to break into spherical, cuboidal, and tabular masses. Its decomposition in many places varies with the structure; and the unequal wasting thereby occasioned has given rise to very singular external forms in the exposed masses. The most common are cuboidal rocks, from a few yards to twenty and upwards in diameter; having their sides traversed by concave vertical grooves, varying in depth from a few inches to about six feet; the sides of the larger concavities being often grooved in their turn. These grooves generally extend from the base to the summit of the rock, a height in some cases of about 40 feet, although generally much less. On the upper surfaces, and on the sides where they are inclined, a succession of hemispherical and pear-shaped cavities are frequently seen; and, where they are wanting, less regular furrows, corresponding with divisional planes, generally supply their place.†

The true explanation of all these phænomena I believe to be that which I offered towards the conclusion of the paper mentioned in the preceding note. It is as follows:—"The blocks, protruding from the hills or ranged along the shores of Pulo Ubin, are more solid and less decomposable masses and nuclei, of which the forms, with the directions of their sides and axes, have, in almost every instances, been determined by structural planes, and which remain after the surrounding rocks have been disintegrated and washed away. With respect to the latter, it is obvious that while the island has been extending by the growth of alluvium in its bays, its more open coast has been slowly retreating, so that what was once a part of the solid land is now a band on its border washed by the sea, but still exhibiting numerous rocky remnants. The larger masses still evidently occupy their original positions. Frequently their seaward face is curved. Sometimes another mass stands behind, merely separated from that in front by a chasm whose sides are parallel. With respect to the decomposition of the rocks on the hills, the soil is entirely derived from this source, with the exception of a very slight surperficial mixture of vegetable matter, which in many places is absent. In general, however, the blocks that remain are decomposing with exceeding slowness. One exception I noticed in the N. W.—S.E., side of a block about 20 feet in height. The laminæ being inclined inwards, in disrupting by their own weight fall some feet in front of the base, where a long mound of earth has consequently accumulated. I have now only to revert to the grooves. The circumstances attending them which any hypothesis of their origin must explain are these: their general prevalence; the existence, however, of exposed rocks devoid of them; their being commonly confined to the sides facing the exterior of the island, although sometimes found on other and even on all sides of a rock; their great depth and regularity; their general coincidence with divisional lines; their conformity to the course of rain; and their antiquity. It is this last circumstance which, presenting at the outset a great difficulty, leads, on further consideration, to what I consider the true explanation. That meteoric influences have been the great agents of erosion I have already suggested. But the antiquity and permanent character which is impressed on the great majority of the rocks, their vegetable coatings, the hardness and sharpness of the eternal edges of the grooves, prove that the rocks must have existed under very different conditions from the present to enable atmospheric forces to produce results of such magnitude. The considerations which have hitherto occupied us in the concluding portion of this paper appear to me to indicate what these conditions were. The composition and structure of the external rocks, unveiled by the action of the sea on the beach, show zones of soft rock,[*] rows of globular decomposing masses, and of harder ferruginous spheroids, &c., susceptible of being detached, and a general tendency to perpendicular division. If, therefore, we conceive the external layer of the island, when it first became exposed to decomposition, to have resembled in character the zone that has beem laid open for our inspection along the beach, it is easy to comprehend how the wasting away of the more decomposable parts might at last leave exposed masses, including bands of the less stubborn material already partially softened or disintegrated under ground, and that the action of the atmosphere and rain-torrents would gradually excavate the more yielding portions, until the solid remnants exhibited their present shapes."

---

* When an exposed rock is attacked, the decomposing portion is washed or falls off, and the decomposition is arrested for the time. Under-ground decomposition tends to spread unchecked on all sides.

† I have described the rocks of Pulo Ubin in detail in a paper communicated to the Batavian "Genootschap van Kunsten en Wetenschappen," in 1847, and published in the 22nd vol. of their Transactions.

---

[*] Some rocks may be seen along the beach with chasms 2 or 3 feet wide, the sides being quite hard and the bottom a soft decomposed substance. In such a

II. METEOROLOGICAL AND HYDROLOGICAL INFLUENCES.

We have necessarily anticipated much belonging to this head. The mean annual temperature of the district is about 81° 25′ (that of the hottest and coldest months differing about 2° 76′); the range from 6° to 7°; the fall of rain about 92 inches distributed over every month in the year, with a considerable excess from October to January.

All the climatic forces which operate on the land are affected by the two monsoons which prevail in the Indian Ocean and China Sea. During the S. W. monsoon from April to October, the Straits of Singapore being to the leeward of the mountain-range of Sumatra, equable weather is experienced in the district. Showers are frequent but seldom long-continued, and the monthly mean of the thermometer ranges from 81·21 to 82·31.

During the N. E. monsoon from November to March, while the Straits of Malacca are sheltered by the mountains of the Malay Peninsula, the eastern coast of our district is exposed to the full force of the monsoon, and the hills that stretch along it are not sufficiently high to destroy, although they considerably modify, its influence in the Strait of Singapore. During the greater part of this monsoon rains fall abundantly, the streams are frequently swollen, and sometimes overflow their valleys, the sun is obscured more frequently and for longer periods, the temperature is lowered, strong winds often prevail, and the sea is more agitated. It is, therefore, in this monsoon that the erosions and abrasions of the land referable, mediately or immediately, to the climate, are greatest.

The heat and humidity of the climate affect the solid inorganic mass of the land chiefly by their favouring the decomposition of the rocks, the growth of vegetation, and the degradation of the soil, These operations are much less marked than those of the sea, but they are incessantly progressing over the whole land,

---

case a zone of rock differing in composition from that adjoining has evidently been gradually decomposed and washed out.

and their effects, when accumulated by time, must be very great. The soil is always kept moist, which causes the decomposition of the plutonic rocks to descend to a great depth; and rain, the most constantly acting and universal mechanical agent of geology, and here gaining a maximum of effect from the configuration of the ground, falls on an average about half the number of days in the year. When it is considered that every considerable shower in Singapore is the parent of innumerable little rills,—each turbid with fine clay and propelling quartz-granules, &c.,—which pour down the sides of hundreds of hills into the valleys, the great beds of alluvial clay appear less disproportioned to the size of the streams. These are very numerous, but, owing to the low level of the country, insignificant; the broad and deep salt-water creeks, which occur at short intervals along all the coasts* and seem to be the estuaries of considerable rivers, seldom extending beyond a few winding reaches, at the top of which they dwindle to petty rivulets of fresh water. None of the Singapore streams have courses longer than six miles, and it is only after heavy showers that they pour down a considerable body of water. The continental part of the district includes one large river, the Johŏr, the course of which, in a direct line from its source in Gunong Blumut to Tanjong Tikong, is about fifty miles; but it may be said to fall into the sea to the north of the district, because the long and broad estuary as far up as Tanjong Gidong is an arm of the sea. It has caused the formation of a large alluvial tract extending along the west side of the estuary. The other rivers of the mainland falling, with one exception, into the Old Straits, such as the Pulai, Sakodai, Tambrău, Lĭbam, and Santi, have all elevated the beds of their valleys to some distance from the Strait to a level between low and high water-mark, and covered them with marine forests. Thus in every valley of the district some of the alluvial processes before-described are constantly proceeding.

The Straits, as we have seen, are sheltered from the direct influence of both monsoons, and it is only when the China Sea is agitated by strong or continued winds during the N. E. monsoon that heavy waves roll into the Strait, and attack all the exposed shores of the three most easterly basins,†—the Peninsular coast from Point Romania to Marbukit, the Batam coast as far west as T. Sin̄gkwang, and the south-east coast of Singapore.

The east coast of the Peninsula and the north coast of Bintang, lying on the China Sea, are at all times exposed to the action of its waves; and the abrasion at all the points, notwithstanding the solidity of the rocks, has been great. It is particularly observable at the promontory terminating in Tanjong Puñgai and Tanjong Kĭnawar, the first of which points is covered with massive globular blocks of iron-ore gleaming like gigantic balls of polished metal, the indestructible fragments of a hill, one-half of which has been destroyed, and of which the cliff behind, notwithstanding its masses of iron-rock, is year after year yielding more spoil to the waves. The hill at the second or northerly point, being less ferruginous, has been ground down to the level of the sea, and nothing is now left but the long quartz-penetrated ledges of its foundation. The extremity of the Siglap and Tana Mera hills on the east coast of Singapore, being composed of soft sandstone and conglomerate, are annually suffering abrasion; large fragments falling down during every N. E. Monsoon. The waste here must have been enormous, for the abraded sand has completely blocked up the whole S. E. coast of ancient Singapore, so that for about ten miles the only spots where the sea touches it are the two hills, the abrasion of which forms Tana Mera Bĕsar and Tana Mera Kichi (the Red Cliffs). This long sand-bank, which has completely dammed in all the water of the plain of Singapore, is the best measure which the Straits afford of the power of the waves raised by the N. E. monsoon, and it is worthy of notice as an instance in which the compensatory effects of abrasion far exceed the destructive, as respects the superficial proportion between land and sea.

---

* The eastern coast of the mainland and S.E. coast of Singapore must be excepted.

† The tidal current sometimes runs for eighteen hours of the twenty-four into the Strait during springs, and for two or three days without interruption during neaps.

"The sedimentary ranges to the west of Singapore plain, which are variously indurated, charged with iron, and highly inclined, have opposed greater resistance to the sea; but the quantity of soft clays and shales which they contain has facilitated its action, and long ribs and ledges of iron-masked rock, stretching across the banks, mark at once how difficultly destructible they are in themselves, and how unavailing they have proved to save the hills which they bound together. At one place the sea has cut through some highly indurated strata and divided an island (Blakang Mati) in two, and a strong current rushing through this narrow gateway into New Harbour, its old circuitous route round the northern end of the island has gradually been filled up with mud, and the detached northern half thus united to Singapore. The islands in the Strait are all greatly abraded,*" and many of them have long ledges running out from their extremities or exposed at their sides. When the sea has worn down a portion of one of these islands below its level, the coralline polyps that incrust its outer margin, where it sinks into deep water, begin to advance upon it towards the land and preserve it from further abrasion. Were it not for the causes to be mentioned, this curious organic shield would effectually defend the rocky foundations of the islands from the attacks of the sea; and in process of time, when the Strait was denuded of all the hills that now rise above its surface, each of them would be represented by a coral-reef of an irregular annular shape.* But in many localities, after the corals have flourished over a considerable horizontal space for some time, yielding strata of sandstone come under the influence of the waves, which grind them down and spread the sand over the coral-field. The speedy consequence is that the polyps perish, and in their place a bed of sand and dead coral is left, which sometimes cements into a hard calcareous layer. but generally becomes a prey to the sea. Living coral-fields are found in all parts of the Strait, but most abundantly in the north-eastern portion of the most westerly basin in the shoals around and between its numerous islets. Beaches from which corals have perished occur frequently; amongst the largest being those in front of Blakang Mati village, the east coast of Sambo Běsar, and Bukum. On coasts of soft wasting sandstone they are seldom found; and in the proper mangrove localities, that is, in sheltered places where mud accumulates, they are either wanting or are scattered in small and weakly patches on spots where sand occurs. Their proper habitat is a beach or shelf of indurated rock abraded to a level below that of the ebb-tide, sinking at its outer margin into deep water, and with a free exposure to the sea so as to be constantly scoured by the waves. Such shelves seldom preserve all these conditions up to the land, so that there is generally an inner space from which the waves retire at ebb-tide. It is still moist, full of small pools, and doted with pieces of living coral, but the continuous coral-beds growing luxuriantly in all their variety of rich colours and beautiful forms, giving a gorgeous pavement to the sea, are not found until this space is passed.

---

* This paragraph so far is copied from my Essay on the Geology of the Peninsula cited before.

---

* If the Strait were to remain perfectly undisturbed by subterranean forces, neither undergoing subsidence nor elevation, it is obvious,, from what we now see to be going on, that these two antagonist powers, water and the coral-polyps, would, in the course of time, leave the Strait without any vestige of land, save some reefs and rings covered and shielded by the coral. These two simple and ever-operating agencies, mechanical and organic, appear sufficient to explain the fact, that patches of land are found over vast spaces of ocean at the same level. Let the present condition of things last long enough, and an aggregation of mountain-groups, like that of the Malay Peninsula, will be abraded, and broken into islands and coral-reefs until island after island is worn down beneath the level of the sea, those only remaining at that level in which the conditions for the continued existence and growth of coral are maintained throughout the process of degradation. In endeavouring to follow out such a process from the facts presented by a coralline sea, like that of the Straits of Singapore, the shores where coral is absent are as instructive as those where it is present; for whatever successive changes the configuration and disposition of the land may undergo in the progress of denudation, the same causes will continue to favour and oppose coralline growth so long as wasting shores and streams of fresh water exist. The process would accelerate as it advanced, and a condition of things approximating to that of the archipelagoes in the open ocean be reached, in which both the mechanical and organic powers are greater than in the Strait of Singapore.

In some places solid beds of calcareous conglomerate are forming on the beaches; and ferruginous conglomerates, breccias, and sandstones are found wherever highly ferruginous rocks exist behind sandy shores.

III. RELATION OF THE ROCKS TO ANIMAL AND VEGETABLE LIFE; AND THEIR ECONOMICAL USES.

Although the soils of the district have not the fertility of the volcanic and calcareous soils which occur in many parts of the Indian Archipelago, they are covered with an indigenous vegetation of great vigour and luxuriance, supporting numbers of animals of different species. The hills of plutonic rock support dense and continuous forests, composed of more than 200 species of trees,* many of which are of great size. So long as the iron is not in such excess as to recompose the clay into stone, or render it hard, those soils which contain most iron are the most fertile. The purely or highly felspathic are the worst. But even felspathic soils, when they have a sufficient proportion of quartz, are, in this climate, capable of producing an abundant vegetation.

Although it is obvious to every observer that there is no kind of soil in the district for which nature has not provided plants that flourish luxuriantly in it, yet it must not be hastily concluded, as some have done, that this exuberant vegetation indicates a general fertility in the soil. It is found, on the contrary, when the native plants are destroyed, and the land is employed for agriculture, that there are very few soils in which cultivated plants not indigenous to the region, but whose climate range embraces it, will flourish spontaneously. While the cocoa-nut, betel-nut, sago, gomuti, and the numerous Malayan fruits succeed well with little care, the nutmeg and clove are stunted and almost unproductive, unless constantly cultivated and highly manured. Yet the climate is perfectly adapted to them. Place them in the rare spots where there is naturally a fertile soil, or create one artificially, and their produce is equal to that of trees in the Molucca plantations. With respect to the indigenous plants, gambier, pepper, and all the fruit-trees flourish on the plutonic hills, provided they are not too deficient in iron and quartz. The hills of violet-coloured shale, where they are not too sandy, are equal to the best plutonic soils, —those, namely, in which there is a sufficient proportion of hard granules to render them friable, and sufficient iron to render them highly absorptive of water without becoming plastic. The sandstone and very arenaceous shale soils are the worst. Of the alluvial soils, the sand, particularly when it contains a mixture of vegetable matter or triturated shells, is the proper soil of the cocoa-nut, and vegetable mud that of the sago. When the country has been better and longer drained and cultivated, the latter soil will become a rich mould; at present it is everywhere too wet and sour to make a fertile soil. Rice is grown on some patches of it. The bluish sea-mud contains good ingredients, but clay is in excess, and the animal matter appears to assist in rendering it hard and untractable when it is not saturated with water. Even for such a soil nature has provided plants useful to man, for the betel-nut and some of the indigenous fruit-trees grow well in it with little cultivation. Although there are cultivated plants adapted for every kind of soil in the district, and it has indigenous tribes who can live exclusively on its yams, sago, fish, and wild animals, it is incapable of feeding a population of the more civilized races; and the latter must always be dependent on other countries for the great necessary of life, viz. rice.

---

* My list contains at present 217 trees, but it is not complete

The rocks which are used for economical purposes are not numerous. The only edible one is the fine clay called *ampo*, which is made into thin cakes, smoked and kept for use.

The plutonic rocks, and the indurated sandstones and conglomerates, are used for the foundations of houses. Lateritic stones are sometimes used by the Malays as pedestals for the posts on which their small houses rest. Granite is used for steps, milestones, tombstones, &c. Of the blue alluvial clays the bricks and tiles are made, of which the town of Singapore is built. The iron gravel and rocks have, during late years, been extensively used for metalling the roads near town and the streets. They soon acquire a compact, hard and smooth surface. The fine kaolin which abounds has been found the best adapted of any in India for the manufacture of porcelain, but no manufactory has ever been established.*

IV. TRACES OF THE GEOLOGICAL HISTORY OF THE DISTRICT.

Having thus given a general description of the actual constituents and arrangement of the rocks of the district, we have next to inquire whether they preserve any evidences of its past geological history, and I think the following conclusions may be safely adopted.

1. Ceasing for a moment to view the district as isolated, it is established that it is a portion of the zone of elevation extending from the Himalayas (or their vicinity) to Banka, or rather to the granite patch in Java; approximately parallel to the plutonic zones of Burmah, Siam, Cambodia, and Anam, which seem to terminate in Borneo; and surrounded by the great volcanic band of the Indian Archipelago, the most active western portion of which, Sumatra, is semi-plutonic, and is parallel and adjacent to

---

* See Dr O'Shaughnessy's Report of Experiments made by him for Government.

the Malay Peninsula from which it is only separated by the broad and shallow submarine valley of the Straits of Malacca.*

2. The sedimentary strata of the district were deposited prior to the elevation of the Malay Peninsula, and therefore prior, probably, to the elevation of the whole south-eastern region of Asia.

3. They were formed from the abrasion of a tract composed chiefly of clays, and probably partially elevated above the level of the sea, or at least so near its surface as to be subject to strong currents. These appear to have prevailed along some of its wasting shores in the vicinity of Singapore, for the water-worn pebbles of the conglomeratic beds entirely resemble, in their variable size and occasional deficiency of abrasion, the gravel at present accumulating in the vicinity of the sea-cliffs. The mode in which they are disposed shows that they were from time to time driven and irregularly heaped by violent currents or waves.

All the sedimentary beds of the district form one series accumulated from the debris of the same rocks, and the region underwent no violent upheaval during the period of their deposition. This is an inference from the generally uniform mineral character of the beds,—particular kinds of clay or shale prevailing everywhere, and the conglomerate layers, wherever they reappear, exhibiting the same peculiar clayey matrix and the same prevailing pebbles. No instance of unconformable stratification has been observed.

The ancient land consisted chiefly of two rocks; 1st, a fine, tough, easily frangible clay, of which the prevailing colour was a dull violet; 2nd, a granite composed of quartz, chlorite, white felspar, and a fine silvery talc, the last sometimes wanting, and all the ingredients apparently varying greatly in their relative proportions at different places. The first rock, reduced to sediment, produced the shales and clays of the district, and, in rolled fragments, furnished a portion of the pebbles of the conglomerates. The second rock, disintegrated and partially decomposed, produced by its debris the great bulk of the conglomerates, of which the matrix is generally quartz-granules mixed with more or less of chlorite or steatitic earth with greenish and yellowish hues. It also furnished a few shale-beds in which chlorite is contained. The quartz-pebbles, generally whitish, but sometimes of black and other colours, were probably derived from this granite also, the quartz in some specimens tending to segregate. It probably existed likewise in contemporaneous veins and nodular masses. The granite, where free from chlorite or the large developments of quartz, furnished the granules of the sandstone-layers; or these may have resulted from a more thorough decomposition of the granite, and the washing of the chlorite and felspar to a distance from the place where the sand accumulated, just as we see, at present, partially angular and rolled fragments accumulating in the vicinity of wasting points, the more finely disintegrated sand carried to some distance and accumulated by itself, and the clay suspended and deposited over a far wider surface, extending to a considerable distance.

---

* See "The Physical Geography and Geology of the Malay Peninsula," Journ. Ind. Arch. vol. ii. p. 89-93.

4. The rocks of this ancient tract differed from the existing plutonic rocks of the district, and the latter were not in existence at the time of the deposit of the sedimentary beds, for no fragments resembling them have been found in these beds, and many of the rocks which most abound in them nowhere exist in the present plutonic rocks. The most conclusive fact is the entire absence of iron-masked pebbles or fragments in the sedimentary strata. The abundance of ferruginous walls in the latter and in the decomposed plutonic rocks, and the constantly recurring layers of ferruginous pebbles and blocks in the modern debris on the surface of the land and along the shores of the wasting points of both formations, prove that beds derived from their decay will be principally characterized by their profusion of such pebbles and blocks.

5. The upheaval of the sedimentary rocks was in general attended with great violence, as is shown by the irregularity in the strike and dip of the beds in numerous circumscribed localities, and the breaking up and mingling of those in Government Hill, &c. Where there are most evidences of violence, there is the greatest development of iron or quartz. The line of disturbance, for instance, which goes through Government Hill, and is continued in the hill south of it, ending in Tanjong Malang or Batu, is marked in the latter by iron-masked blocks and gravel on the surface, sandstone indurated and pervaded by an iron-honeycomb, iron-mammillated crusts on the sides of the beds, &c., and in Government Hill by the clayey beds adjacent to the disrupted sandstone being converted into the typical laterite, and by the sandstone at some places near the junction being broken into a mass of small fragments recemented by iron and clay.*

6. The formation and intumescence of the plutonic rocks of the district caused this upheaval, and gave the prevailing direction to the stratification and to the ranges of hills, this direction agreeing with of the plutonic zone of the Peninsula.

7. The partial metamorphosis, induration, and *ferrugination* of the sedimentary strata were effects of this plutonic action.

8. The vast abundance of iron evolved during the plutonic intumescence, and rising into the strata, is the distinguishing peculiarity of the Malayan zone of elevation,† and its wide-spread

---

* I trust to be able ere long to give a full account of the mechanical effects of the upheaval in different parts of the district.

† But common to it with the adjacent belts rising from the same platform—that of S.E. Asia and the approximately parallel and probably contemporaneous Penin-

effects so strongly strike the eye that the other changes are less observed; but the latter evince even more decidedly the potency and the unity of the elevatory agent, and are particularly worthy of attention as assimilating that agency to the more common kinds of plutonic metamorphosis. The soft strata in some places have been converted into Lydian stone, porcellanite, clay-slate, hornblende slate, steatite, and chert. If we extend our observations a little beyond the district, we find similar changes on a much greater scale. Thus the eastern coast of Pulo Krimun Kichi (Little Carimon), which rises only eighteen miles to the west of the last of our sandstone islets in that direction, is composed of a conglomerate converted into the hardest chert. In many of the islands in the China Sea off Pahang the metamorphosed rocks are so indistinguishable from greenstone, that we can only recognise them as sedimentary by the presence of pebbles which some of them contain. In Pulo Tioman the junction of granite with a green, grey, and black hornblendic rock is well displayed, the granite sending veins into the hornblende, and masses of the latter being sometimes imbedded in the former, clearly proving that the hornblende, whether volcanic or (as I believe) metamorphic, is the more ancient rock.

9. One of the most striking characteristics of the district is the protean nature of the plutonic transformations, remarkable alike in the diversity of the plutonic rocks themselves, and in the numerous degrees and kinds of change which the plutonic agency has produced on the strata. There are considerable tracts in each of which the granite undergoes little variation, but which differ decidedly from each other. There are tracts where the plutonic rock graduates or passes abruptly from large-grained granite to the most finely grained, or, losing its quartz and mica, passes into greenstone or into compact felspathic or hornblendic rocks. Amongst the sedimentary rocks we find that some, near the line of junction with the plutonic, have merely become ferruginous, while others, apparently distant from it, have become highly indurated. The same rock, completely iron-masked at one place, exhibits no change whatever a few feet off. We have seen that the mechanical action to which the strata have been subjected participates in this want of uniformity.

10. Is the explanation of this character of the district,—the absence of all other sedimentary formations, but the existing limited one, the entire disappearance of the ancient rocks which composed the district when the present strata were being formed, and the mode in which the plutonic exhalations have freely risen through the latter,—to be found in the circumstance of the plutonic action having extended to the surface of the ancient land

sula of Southern India. This peculiarity is found in S. India, Bengal, the Malayan belt as far north as it has been examined, Borneo, and the N.W. part of Australia.

(whether beneath the sea or not is another question) and assimilated it all, excepting a thin crust of the newest and highest beds, or rather bands and patches of that crust, which now lie scattered over the great plutonic mass of the Peninsula? It is clear that granite does not require a greater pressure for its formation than the so-called volcanic rocks into which it passes. In Pulo Ubin and other localities, we see, in the same rock, at one place a perfect granite, composed of large crystals of quartz, felspar, mica, and hornblende, and at another a compact or finely granular greenstone or basalt, so that the granitic form does not necessarily depend on the depth at which crystallization or plutonic metamorphism takes place.*

11. At the time of the upheaval of the strata they were new, and had neither been consolidated by great pressure nor indurated by any prior plutonic action. Where they have escaped the influence of the ferruginous and siliceous exhalations and the heat given out during their elevation, the more aluminous beds are still soft clays, and the arenaceous slightly coherent sand, sometimes not distinguishable from the beds of clay and sand forming along the shores at present.

If the now visible plutonic rocks had been formed at a great depth and under a vast equal pressure, they would have been more uniform in their composition and structure, and in their action on the immediately superincumbent strata. They would have more slowly cooled down, and the adjacent strata, long exposed to the heat, would have acquired a certain general induration. If the strata had still been accumulated over the plutonic mass to a great thickness when the latter ceased to reduce them, and been subsequently pared down to their present remnant by denudation, they would not have been broken up in the manner in which we see them to be, but disposed in a mode resembling that in which the great aqueous formations of Europe and America are arranged around or on the flanks of plutonic mountains, and in which the strata of the ancient land may perhaps yet exist in some parts of the flanks of the great intumescence or submarine elevation of of the Malayan Archipelago where it rises from the bottom of the Indian Ocean.

12. The prevalent layers and heaps of volcanic-like gravel were not ejected. They are merely the accumulated debris of walls and veins arising from the decomposition and washing away of the softer parts of the containing rock, and remaining by virtue of their ferruginous and jaspideous composition, which resists atmospherical action.

I have found all the forms of the gravel in the places where they were generated,—that is, in the walls traversing the solid or partially disintegrated rocks.

---

* See account of the rocks of Pulo Ubin, p. 22, Trans. Batav. Soc. Arts and Sc.

13. The iron was not injected in a fluid state into the strata, as lava is into fissures, but was either imbibed or, as is most probable, conducted by vapours, gases or electric currents. The ferruginous and quarto-ferruginous rocks, *including laterite,* wherever minutely examined, prove to be the original rock of the situs metamorphosed, and not a foreign rock injected from beneath; and there are evidences in all classes of the rocks affected, that the iron, although ascending in abundance wherever the rocks were fissured or weakly coherent, was thence transfused without its exerting any mechanical force, and without the slightest disturbance of the previous arrangement of the particles of the rock.[*]

14. It is probable that the plutonic rock was not in a molten state up to its contact with the strata, because if it had been, the fissures, which must have been caused by the irregular force exerted on the strata and their frequent disruption, would in that case have given rise to true dykes and veins, *i. e.* those formed by fluid plutonic or volcanic rock being pressed up into rents.

15. The numerous ferruginous dykes which ramify in the plutonic rocks were contemporaneous, because if we suppose them to have been true dykes produced subsequent to the intumescence and consolidation of these rocks, the enormous force, necessary for rending and cracking them in so many directions, would have extended the fissures into the superincumbent strata, and the injected dykes would have been continued into these strata also. The contemporaneity of the ferruginous dykes is further proved by the mode in which they are connected with the adjacent granite in localities, such as the coast of Batam and the Water Islands near Malacca,[†] where they can be examined in the undecomposed rock.

16. The more highly ferruginous parts of the walls in the plutonic and sedimentary rocks are identical in appearance, the proportion of peroxide of iron which they hold being so great as

---

[*] The entrance of the iron was, however, in many cases simultaneous with mechanical strainings and ruptures of the rocks, and, when rising abundantly into the main walls and forced thence into the lateral ones, must have exerted considerable pressure. The mechanical straining and the exhalations were both effects of the same cause, the plutonic intumescence. The only case which I have observed of a direct connection between the matter of the walls and a mechanical alteration in the adjacent rock is seen when quartz is largely developed in lumps in the quartz-ferruginous dykes. The adjacent unaltered layers are pressed together and bent so as to make room for the quartz. Even here I do not think this is attributable to a large accession of new matter, but mainly to the expansion of bulk attending the conversion of the siliceous particles of the original rock into crystalline quartz.

[†] Malacca, including Naning, in all its main features, is identical with the district of the Straits of Singapore. All the phenomena of elevation, ferrugination, &c. which we see here are there repeated. See ' Five Days in Naning,' by the Writer—Journ. Ind. Arch. (for May 1849) vol. iii. p. 282.

entirely to disguise the original rock. The peroxidation of the iron tends to obliterate all traces of its original condition, and to give a uniformity of aspect to all the rocks which I have designated as iron-masked,* so that we shall not be able to see in what form the iron exists prior to the exposure of the rocks to atmosphorical influences, until we have much deeper sections than are anywhere exposed at present. It is obvious, however, that the effect of decomposition has been to saturate the water in the rock with oxidized iron, and diffuse it more uniformly through the arenaceous and aluminous matter of the walls. If the oxidized crust of the district, which probably descends to a considerable depth, were pared off, the peculiar aspect and structure of the iron-masked rocks would disappear; the deep rusty, dark brown and black colours, and the scoriform, vesicular, and tubular structure, of the walls and lateritic patches, which now so powerfully arrest the attention, would be nowhere recognized, and in place of them we should see in the walls of the sedimentary rocks the ordinary matter intermixed with pyrites and other unperoxidized forms of iron-ore, and in those of the plutonic rocks, similar forms of iron, accompanied probably by a predominance of those common plutonic minerals in which iron is a large ingredient, owing to its accumulation there at the time of the crystallization. The ready decomposition of iron-pyrites would account for the great depth to which the walls and veins have been peroxidized.

17. It is of great importance to determine, if possible, the

---

* "The interest which the discussions respecting laterite have given to that rock tends to invest it with undue importance geologically. The ferruginous emissions have penetrated all rocks indiscriminately, and their action on sandstones, grits, and conglomerates is as well-marked as that on clays, marls, and shales, although the latter only produces proper laterite. Even in the clays, laterite denotes one only of many degrees and forms of alteration. The express the origin of these rocks, and its unity, to record the cause of the difficulties which they have presented, and to distinguish them from true metamorphic rocks, I would propose, avoiding any new technical names, to term them simply the *iron-masked* rocks of the Indo-Australian regions. This term will include the principal or plutonically ferruginated rocks, which, without being either completely reduced or metamorphosed, have been either wholly disguised or partially altered by ferruginous emissions, which have saturated them in the mass, or only affected them in fissures and seams, or have been interfused between portions of the rocks not actually separated by fissures, but intersected by planes of mere discontinuity, the sides of which have an imperfect cohesion, or having a common border of inferior density and increased porosity, caused either by interruptions in the original deposition of the matter of the rock, or by unequal stretching, or incipient cleavage. The term may be also extended, perhaps, to those sedimentary beds in which the iron-saturation. although coeval with the deposit of the other constituents of the rock, has served to obscure or conceal their true nature as well as the derivation of the beds themselves. These beds appear to have been sometimes formed by superficial layers of gravel, &c. being permeated by iron solutions. With these must not be confounded the broad bands lying over and beside the heads of iron-masked dykes, and which, having been in a loose gravelly or fragmentary state at the time when the plutonic emissions passed through them, became converted into hard, and occasionally scorious, ferruginated conglomerates, &c., and are therefore proper plutonically iron-masked rocks." (Journ. Asiatic Society (Calcutta,) vol. xvi. p. 521).

state in which the iron was originally deposited, and why it was given off so abundantly by the plutonic intumescence. It appears probable that it was volatilized in combination with sulphur.

Is its abundance owing to the ferruginous character of the old land out of which the plutonic rock was formed, and do the highly hornblendic portions of this rock indicate a more than ordinary prevalence of iron in their parent sedimentary rock? The chocolate-coloured shale-band would probably produce such a granite. Sandstone appears along the western boundary between the granite and this shale; but near the present Arrack Distillery, where they are in contact, the granite is very ferruginous, decomposing into a dark-red soil, and containing half-decomposed masses approaching to iron-ore.

18. I have searched for the continuation of the ferruginous walls of the sedimentary rocks into the plutonic rocks. Unfortunately the line of junction of the two formations has not anywhere been laid bare, all the points exposed to the action of the waves being exclusively of the one or the other, and the deep superficial bed of earth conceals the undecomposed rocks in the interior. Last year a cutting of a few feet at a point (the south angle of Sri Menanti nutmeg-plantation at the junction of the River Valley and Tanglin roads) where the formations meet, exposed a portion of a stratum of coarse-grained sandstone lying in an irregularly convex form on the decomposed plutonic rock, which appears to have been syenite. This has covered it in some places, and probably the whole or the greater part of the mass was originally imbedded in it. The surfaces are irregular and uneven, but have a general correspondence with the plane of the bed. It varies in thickness, having in some places 4 or 5 feet of well-preserved sandstone while in others it shows only patches and ferruginous plates in the syenitic clay. It varies from a fine sandstone to a coarse grit, and some parts are conglomeratic. In some places it has been converted into a mass of hard and difficultly frangible iron-ore. Where least altered the rock is hard but brittle; the granules and pebbles of quartz are all preserved, but they have a dull whitish and yellowish colour, and rest in a basis of hydrous peroxide of iron, varying in colour from dark-brown to black. The microscope shows this basis to be not compact but vesicular, fine scales or plates surrounding the quartz-granules and partly filling the interstices between them. Where the clay meets the sandstone, the latter has generally a continuous crust or plate of shining, black, compact ore. Irregular systems of a similar crust are sometimes seen with the clay between them. At other places the whole is cellular, and a perfect laterite is produced. Sometimes this structure is seen continued from the bed of sandstone into the clay, where the ferruginous ramification and blotches become softer and admit of being cut by the hoe.

In some places the iron has not pervaded the sandstone, but only penetrated it in layers or veins. In these cases it has been disintegrated into a soft ferruginous sand. Where the iron has been diffused the sandstone is undecomposable, and remains hard but brittle. This locality exhibits, 1st, solid, compact, shining, ore; 2nd, cellular ore filled with decomposed syenite; 3rd, variously iron-masked sandstone and grit.

I have hitherto proceeded on firm ground, but, in extending these deductions much further, must take a direction where many may not be disposed to follow, and where we cannot yet hope to obtain a sure footing. I venture, however, to suggest as hypotheses deserving of deeper investigation the following additional views which my observations strongly tend to support.

Whether the plutonic rocks are simply the product of a heat above the melting-point, or were formed at a lower temperature by chemical and electrical action induced by the heat, the sedimentary rock in contact with and raised upwards by them must have been partially reduced into the plutonic mass. In either case, the upper portion, at least, of that mass is a recomposition of the lower of the sedimentary rock, with an addition of new ingredients from below; because, so long as the heat was so intense as to produce perfect mixture, agitation, and motion *inter se* of the reduced matter and the plutonic mass into which it entered, the upper limit of the bubble must still have been distant. So long as this level was not reached, each successive portion or layer of the sedimentary ceiling must have passed through similar changes before it became obliterated by complete absorption into the plutonic intumescence,—first becoming affected by the mechanical pressure, and then by the increasing heat and exhalations of the labouring mass below. Therefore, at whatever level the plutonic force, whatever its precise nature may have been, ceased to assimilate the superincumbent rock, this rock, to a certain distance above that level, must have passed through the same stages of alteration, exclusive of the ultimate one, which the plutonic mass in contact with it had itself gradually undergone. Whatever changes we can now observe in the remaining sedimentary rocks adjacent to the plutonic bosses, we may conclude that the *plutonization* of the latter commenced in the same way; and this we may do with perfect confidence, when we find that these changes are seen over a great region. If these postulates be well-founded, the phænomena of the district of the Singapore Straits, which are repeated throughout the whole chain of the Malay Peninsula and its prolongation to Banka and Billiton, disclose to us this fact, that the conversion of the sedimentary into plutonic rocks began with their being pervaded, in fissures and lines of inferior cohesion, with ferruginous exhalations, producing ferruginous walls and veins.

Since in the now solid plutonic rocks we find similar walls and veins, the presumption is that these are the same walls and veins by which the metamorphism commenced. This is a simpler theory than that which would require the process of plutonic assimilation, as it advanced, to have first obliterated those originally formed, and then created a new system so remarkably similar to the old one. In what way could such systems of ferruginous walls and veins have been produced *de novo* in a plutonic mass thoroughly melted down into uniformity? If it were clearly demonstrated as a general theory that plutonic rocks are congealed from a state of fluidity, it might, notwithstanding these and other difficulties attending its application to the rocks of the district*, require us to reject the simpler theory which these rocks inculcate. But plutonic geology is in too imperfect a state to entitle us to assume any general theory as established, and nothing but the assumption that granite is necessarily, everywhere, a product of complete igneous fusion, requires us to suppose that two successive systems of ferruginous walls were produced, one at the commencement, and another before the conclusion, of the plutonic change.

If we are satisfied to suppose that only one system was produced, until some proof be adduced that it could not possibly have remained unobliterated during the plutonic process, these walls and veins become objects of the highest interest and importance, and all the phænomena connected with them demand attention.

I shall only here advert to one, the concentrically laminar coloration, frequently seen on a small scale, and so splendidly developed in Sabaru, Jong, and Bukum. The very same zoned coloration is observable in some of the sections cut into decomposed plutonic rock, such as that where the public road crosses Mr Hewetson's Hill, where similar zones exist on the sides of a ferruginous dyke. The neighbouring solid greenstone possesses the same structure as this decomposed rock, nests of hornblende, corresponding to the red patches, and hornblendic lines, often very minute, to the curved zones. When we examine the great developments of solid plutonic rock, we find that they present similar phænomena. The granite of Pulo Ubin, for instance, when its coherence is weakened by exposure to the action of the sea, exhibits connected systems of concentric and variously curved laminæ, in which one system is interrupted and modified by another, and accommodates the shape of its curves to it, precisely as we see in those of the coloured lines of the sedimentary rocks.

If we do not adopt the theory of the necessity of granitic fluidity, may we not suppose that, as the plutonic action first invaded the superincumbent strata in the ferruginous walls and veins, it operated principally through them wherever they existed; that even when complete assimilation took place they still remained, however modified;* that the concentric ferruginous zones to which they gave birth determined the structure of the ultimate plutonic rock, and, to a certain extent, the arrangement of hornblendic and other ferruginous minerals; and were perhaps the channels by which an electro-chemical operation, emanating immediately from the walls, was made to prevade all the adjacent parts of the rocks, until crystallization was induced, and the metamorphism was complete?

---

* Before I had ascertained the connexion between the ferruginous walls in the sedimentary and those in the plutonic rocks, I endeavoured to explain the phænomena of composition and structure presented by Pulo Ubin, in accordance with the theory of congelation. See the 'Rocks of Pulo Ubin,' *loc. cit.* pp. 26 to 40.

The district, considered as more or less metamorphosed, exhibits two sets of phænomena, one where the ferruginous walls and lines are the principal feature, and the other where they are rare or absent. In the first case the plutonic action appears to have extended to great distances from its place of full operation, and in fact to have had no limit but the length of fissures and planes of discontinuity in the superincumbent rocks. On the other hand it has often been extremely weak, hardly extending beyond the walls, and leaving the adjoining rock unaltered. In the second case the plutonic action appears to have from the first pervaded the whole mass of rock, as far as it operated, and to have produced the following succession of changes, examples of all which occur: —1st. The original rock is indurated in different degrees: 2nd, a subcrystalline texture is induced, but without any perfect crystals being generated; 3rd, crystals of particular minerals begin to appear in this basis; 4th, the same process is continued and various forms of crystalline rock are produced, the granitic being that where the conditions of crystallization were most favourable, either from the longer continuance or greater intensity of the plutonic action. The process when preceded by the formation of ferruginous walls is the same in effect, as these merely tend to determine the manner in which the iron is diffused, the lines where crystallization begins, and particular minerals are generated, the structure in the mass of the regenerated rock, and the distance to which the plutonic action, in its various degrees and with its various results, extends.

It is evident that fusion did not precede crystallization in the progress of change up to the formation of the highly crystalline porphyries of Pulo Nanas, South Point, and many places in the eastern islands, and in the greenstones and other highly hornblendic rocks which are undoubtedly the common dark shale of the district disguised, since the graduation from the one to the other can be traced. On the other hand there is no direct evidence that the granitic form was preceded by fusion, while all the facts we have been considering, particularly the generation of other crystalline forms without fusion and the passage of these forms into the granitic, tend to show that it may be produced without fusion. The truth probably is that powerful electro-chemical action can produce all the effects of crystallization from fusion,[*] and that the whole series of nether-formed rocks, volcanic and plutonic, may be produced in both modes. It is probable also that wherever an electro-chemical action is so intense as to generate the granitic and other highly crystalline forms, it emanates from a lower region where the heat is so great as to cause fluidity.[†]

---

* In the course of the crystallization of the rock they were probably converted into ores of iron where the iron was in excess. In some walls and parts of walls, and in the lateral radiating zones, where the iron was too thinly diffused to generate proper ores, it would produce a predominance of hornblende, black mica, and other ferruginous minerals.

J. R. LOGAN.

Singapore, 1*st June*, 1849.

Remarks on the accompanying Geological Map.

The basis is the Chart made from the Surveys of Mr Thomson and Captain Congalton, published in 1846. The rivers, creeks, and alluvial tracts of Singapore I have added from later and unpublished surveys by Mr Thomson, which he has kindly allowed me to use; and from the same source I took the great majority of the additions and corrections of the names of localities. The insulation of Tanjong Surat and the rough outline of the estuary of the river Johŏr above it are merely from my own observations, and not from a survey. The coast of Batam has not been surveyed. A general outline with some blanks appears on the published chart. These blanks and the names of localities I have filled in from my own observation, as well as the names of islands to the west of it from P. Blakang Padang to P. Kapal. The Silat Batu Haji I copied roughly from a Dutch chart. The orthography of the Malayan names, which has hitherto varied greatly, has been corrected in accordance with the system which I have lately adopted in the 'Journal of the Indian Archipelago,' as the most simple, uniform, and accurate which occurred to me, after giving much consideration to the subject.

---

[*] In the crystallization of a molten rock the same electro-chemical action may operate. The process must be greatly similar in both cases. The electro-chemical force segregates minerals and gives a symmetrical structure in spite of the solid form of the rock in the one case, and in spite of its fluid form in the other. The solid form tends to keep each particle of the matter of the rock in the place where it has been deposited, the fluid form tends to keep them all mixed up indiscriminately. The electro-chemical agencies of plutonic regeneration perform their office unshackled by either kind of resistance.

[†] Fusion is perhaps not necessary to account for plutonic intumescence and the consequent elevation, rupture, and inclination of superincumbent strata. If granitic crystallization is always attended with expantion (see the "Rocks of P. Ubin," *l. c.* p. 318), the amount in a vast plutonic mass like that of the Hindu-Chinese and Malayan Peninsulas, Sumatra and Borneo, with all the inequalities of degree to which the process is evidently subject, might be sufficient to account for the condition in which the sedimentary remnants are now found resting on it.

The geological colouring is entirely from my own observations, with the exception of Pulo Pisang,[*] Gunong Pulăi,[†] the islets to the N. W. of the Krimuns (Carimons), a few places on the coast of the mainland in the Silat Tambrău, the south coast of the S. E. part of Johŏr from Tanjong Stapah to Point Romania, the islets and rocks off that Point, and the coast of Bintang with the islets and rocks off it, all which are from information, and partly from specimens, given me by Mr Thomson. Long Island to the south of Barn Island I have not visited. It is described in an account of a voyage round Singapore (by Mr Crawford, I think) long ago published in the 'Singapore Chronicle' as sandstone and clay-slate.

The alluvial valleys, running Singapore Plain from the N. W., have been laid down with much care; and, as Mr Thomson is well acquainted with the ground, they may be relied on as accurate. Those at the back of the island are also correct, but the exact outlines of the bases of the hills have not been laid down, no land-survey having yet been made of that part of the island, and dense mangrove and other jungles generally concealing the outlines.

Coral-reefs fringe the south-western shores of Singapore Island and the shores of the islands to the south, the northern coasts of Batam, with the adjacent islands, and a group of small islands in Tilo' Subong. Isolated patches of coral occur also on the eastern coasts of Singapore.

No theory is intended to be expressed by the colouring, which is entirely mineralogical. The sedimentary tracts are coloured violet where the violet and chocolate shales predominate, and burnt sienna where, on the whole, sandstone, grit or conglomerate prevail. But beds of the latter are found in the former and *vice versa*. The crystalline rocks (including granite, sienite, greenstone, greystone, porphyry &c) are coloured pink. The highly indurated cherty rock such as *P. Pisang, P. Sijahat,* western *T. Putri, Johŏr hill &c.* are coloured purple.[‡] The coral reefs and patches are yellow; the flat alluvial tracts green.

Explanation of Geographical Affixes used in the Memoir and Map.

Suñge *or* Suñgĕi (S.)	*river, streams.*
Ayer	*water, streams.*
Pĕrmatang	*a long elevation.*
Busong	*a spit of sand.*
Lubu	*hole, concavity.*

---

[*] See p. 188, *Note*. Not included in the accompanying Map.

[†] G. Pulai (2152 feet high) lies N. W. by W. of S. Sakodai, beyond the limits of the map. It forms part of a tract of "Crystalline rocks" runinng N.W.—S. E.

[‡] As Malayan words too often receive very barbarous treatment at the hands of European writers I have appended a list of names of places along the coast of Singapore the correctness of which, with a few exceptions, may be relied on.

Paya, *marsh.*
Sĭlat, *strait.*
Tĭlo', *bay.*
Tana, *land.*
Tĭbing, *bank, cliff.*
Pasier, *sand, a sandy beach.*
Gunong, *mountain.* (G).
Bukit, *hill.* (B).
Tanjong, *promontory.* (T.)
Pulău (Pulo), *island.* (P.)
Malang, *rock above water.*
Batu, *stone, rock.*
Padang, *plain.*
Kampong, *a collection of houses.* (K.)

Names of places on the Southern Coast of Singapore from E. point (T. Chañggēi) to the W. Point (T. Gul).

Tĭlo' Paku
Bĭting Kusa
Tĭlo' Baru
Tana Mera Bĭsar
Ayĕr Gămaru
Tĭlo' Mata Ikan
T. Mañgkwang
T. and S. Bĭdo'
Tana Mera Kichi
Kampong Jawa
Kampong Baru
Siglap
Tĭlo' Kŭrau
Tanjong Katong
Mantigi Tăbăl
T. Ru
S. Gelang
S. Kalang
S. Rochor
K. Glam
Bras Basa
S. Sĭñgapura
Tĭlo' Ayĕr
T. Malang
T. Pagar
S. Sĭraya
Tampelos
Tĭlo' Blañga
T. Aur
T. Sĭpet
Tĭbing Tiñggi
Pantei Chĭrmin
Ayĕr Chĭrmin
S. Bĕlayer
Batu Belayĕr
T. Tĭlaga
S. Labu
S. Pandan Kichi
S. Pandan
T. Pĕnjuru
S. Jurong
S. Bruno
S. Propo
T. Kling *or* Kampong Glam
P. Sambulăn
S. Benui
S. Tămboăn
S. Gulu

Islands along the South Coast in New Harbour.

- Pulo Branĭ
  - T. Tere
  - Ayĕr Brani
  - T. Sĭlinsĭng
  - T. Tărigi
  - K. Kope
  - T. Risĭm
  - Tĭlo' Saga
- Pulo Blakang Mati, *or* Panjang
  - T. Sarang Rimau
  - Malang Itam
  - Blakang Mati
  - Ayĕr Krĭng
  - Sĭlah Pulo
  - Bărala Kepĭng
  - Ayĕr Băndara
  - S. Sĭrapang
  - Kuching Gila
  - Lubo' Bakau

Pasir Panjang
Ayĕr Batu
S. Nĭpa
Ayĕr Jambu
Pata Tĭlor
Ayĕr Raja
P. Sĭlugu
Ayĕr Imbia
Tĭrumba Bĕrdaun
P. Hantu
Ayĕr Champang
Sĭluso

Names of places along the Northern Coast of Singapore in the Old Strait, proceeding from West to East.

T. Gul
T. Rawa
S. Toăs or Choăs
T. Rawang
Bukĭt Piatu
Karang Kampong
S. Blukang
S. Tèn͠ge
Pasir Laba
S. Taung
Bĭlire
Ayĕr Bajau
S. Brih
P. Pĭrgăm
S. Morei
T. and P. Sĭrimbun
S. Pĭrămpăn
S. Buloh
S. Kranji
S. Mănde Bĕsar
S. Mănde Kichi
Ayĕr Panchor
S. China
Batu Rimau
S. Sĭnoko
S. Sămbawang
S. Sempang
S. Kĭte Pongsu
S. Sĭletăr
Pomo
S. Pus
S. Pon͠ggol
S. Sĭran͠ggong
Pasir Rĕis
S. Tampenĭs
S. Loyăng
S. Sĭlarang
Batu Puteh
Pasir Pălakat
S. Chan͠ggĕi
Kubu Ache
Pasir Bangsal
T. Chan͠ggĕi

Names of places on the Mainland along the Old Straits of Singapore, proceeding from West to East.

T. Poh
Sĭnduyong
S. Păndăs
Jaman Dudu
S. Kamudi
Kampong *and* S. Bahăn
S. Toan
T. Boar, *or* Tana Runto
S. Boar
S. Pĭrăpăt
T. Putri
Sĭnibong Putĭh
S. Rĭko
S. Man͠gsĕi
S. Sĭkadang
Kampong Bentan
S. Pĭrĭmbi
S. Buloh
Kampong Baru
S. Tukong
Ayĕr Biru
T. Tăbăl

S. Malayu
S. Doñga
S. Sĭkodai
S. Chat
S. Aket
T. Putri
S. Sĭrañggong
S. Tămbrău
S. Pĭrmas
S. Sĭnibong
S. Lunchu
S. Singu

S. Bĭlantăr
S. Kingkăm
P. Nanas
T. Kopo
P. Ubin
  T. Tajăm
  T. Tĕloh Paléi
Malang Papan
P. Sĭkodo
Batu Babi
Pinang Rawang
Pulo Kĭtăm

NOTICES OF PINANG.*

THE following letter from Mr Dickens, the Judge and Magistrate of the Island, addressed to the Secretary to the Supreme Government of India, should have appeared in a former number and is here introduced as containing a concise account of the state of the Law and of its Administration in 1803:—

Sir,

It is with the express permission of the Lieut-Governor of this Island that I now have the honor of addressing this letter to you, and for the purpose of its contents being submitted to the consideration of His Excellency the Most Noble the Governor General in Council.

2. The Lieut-Governor, who has assured me that he will transmit this my representation, will probably remark thereon, but if the Lieut-Governor should deny the facts as stated by me, I must beg of you to lay before His Excellency in Council my request that I may be allowed to substantiate, by evidence, any facts stated by me in this letter which may be controverted by the Lieut-Governor.

3. I find it necessary to premise, that His Excellency in Council on the 23rd June 1800 appointed me Judge and Magistrate of this Island, honoring me at the same time, by recording that I had practised with considerable reputation at the Bar, and that I was fully qualified for the discharge of the judicial duties of the Island, now become laborious and important—that at His Excellency's desire (personally communicated to me) I prepared some observations, which on the 1st October 1800 I humbly submitted for the consideration of His Excellency in Council, with a view to enacting certain regulations for the administration of Civil and Criminal Jurisprudence and for the establishment of Courts of Civil and Criminal Jurisdiction and of an efficient Police, at Prince of Wales Island,—that on the 22nd of January 1801, I humbly submitted for the consideration of His Excellency in Council some additional observations on the same subject—that on the 30th of April 1801, I was directed to proceed to this Settlement by the first favorable opportunity, and on my arrival here to enter upon the discharge of the duties of the office to which I had been appointed, and continue to act upon the principles of the existing laws and regulations of the island until further orders—that on the 7th of August 1801 I arrived at this settlement—that neither upon my first arrival nor at any time since, did the Lieutenant-Governor by word of mouth, or in writing, communicate to me or converse with me about the duties of the office

---

* Continued from p. 146.

of Judge and Magistrate, except that I was, soon after my arrival, told by the Lieutenant-Governor's Secretary, that the whole of the Police establishment was under the immediate orders of the Lieutenant-Governor himself, and that neither that establishment, nor the native Captains were under the orders of the Magistrate.

4. The gentleman who officiated as Magistrate at the time of my arrival was the first assistant of the Lieutenant-Governor, and it was his duty as an assistant to the Lieutenant-Governor to carry the Lieutenant-Governor's orders into effect. But I was not appointed an assistant to the Lieutenant-Governor, and no doubt because the wisdom of His Excellency in Council foresaw that the best security for the impartial Administration of Justice, in an island where the government is otten virtually interested in the decisions of the Judge, was the independency of the Judge. In my letter therefore to the Lieutenant-Governor hereinafter mentioned, I expressed my surprize that Magisterial authority was withheld from the Magistrate, but as regulations for the island were daily expected from His Excellency in Council, at that time I acquiesed without representing the circumstance of the Police establishment (from the time of my arrival) being separated from the authority of the Magistrate, and of the native Captains being then made independent of the Magistrate. It is now however my duty to state expressly for the information of His Excellency in Council, that from the time of my arrival here in August 1801 to this day, although I was appointed Magistrate of the Island, by the authority of His Excellency in Council, I have not been allowed to perform the functions of a Magistrate, by the immediate interference of the Lieutenant-Governor and his Secretary, and that the name of Magistrate has alone appertained to me.

5. The Lieutenant-Governor did not furnish me with any copies of any existing laws or regulations. The gentleman who acted as Magistrate on my arrival, gave me no material information of any kind relating to the duties of my office, and the only papers which can, in any respect, be supposed to be the existing laws and regulations of this island are the following documents: A letter of the Governor-General in Council, dated 1st of August 1794, addressed to Mr Light—some Proclamations, Advertisements and Regulations, respecting the Police, the Convicts, the Bazar, the Management of Cattle, the articles under which the revenue is farmed and the registering of mortgages, with perhaps some less important articles that I do not now recollect.—These are written in a book, which was delivered over to me by the former Magistrate at the time of my arrival, and these are all the papers which can be supposed the existing laws and regulations of the island, which, from the time of my arrival, until this day (except the Lieutenant-Governor's instructions to the Native Captains) have been by any one communicated to me either

directly or indirectly, and I have not been able upon my own researches to discover any other existing laws or regulations of this island.

6. His Excellency in Council has been heretofore informed that Prince of Wales Island prior to its cession in 1785 was under the dominion of a chief who governed arbitrarily, and not by fixed laws. It is now become my painful duty to state that it has so continued to be governed without fixed laws, for upon the hour of my arrival on this island there were not any Civil or Criminal laws then in existence, and there are not even now any Municipal, Criminal or Civil laws in force on this island. The law of Nature is the only law declaring crimes and respecting property, which to my knowledge at this day exists at Prince of Wales Island, and as judge it is the only law which I can apply to the criminal and civil suits brought in judgement before me. But as the law of Nature gives me no precepts respecting the right of disposing of property by wills and testaments, the rights of succession and inheritence, and the forms and precautions necessary to be observed in granting probates of wills and letters of administration to intestates effects, or respecting many other things which are the subject of *positive* law, I have often been much embarrassed in the execution of my duty as judge in the court of Justice in which I preside, and many cases there are in which I am utterly unable to exercise jurisdiction.

7. The cultivation of the island, the increase of its commerce and of its population, has made it necessary that fixed laws of property as well as laws declaring what acts are crimes, should be promulgated by due authority. The inhabitants before my arrival had, I am told, their civil causes more quickly decided; and summary hearings no doubt have their advantages, but my judgments, until confirmed, are not valid. Formal and plenary proceedings are therefore now necessary, not only to protect the liberty and property of the people, but also to protect the character of the judge, who must show on the face of the judicial proceedings the whole subject matter of his decisions. This creates to me incalculable labor, and some delay, and it has been one of the causes of my addressing His Excellency in Council and the Lieutenant-Governor of this island, with a view to the enacting a code of criminal and civil municipal law.

8. Thus on the 31st of August 1801, I addressed a letter to the Lieutenant-Governor, a copy of which letter I had heretofore the honor of transmitting to His Excellency in Council, and I now beg leave to refer thereto for further particulars. Thus, on the 25th of October 1801, I presented to His Excellency in Council, that to prevent disturbance and tumult, a positive law was immediately requisite declaring the rights of succession and

inheritance, the law of wills, and the mode of granting probate of wills, and letters of administration to the effects of persons dying intestate, and that it was necessary that the magistrate or some other person, should be empowered, as ordinary, to take possession of the real and personal property of persons dying intestate on the island or where they left executors who were absent, and to hold the same *quantum jus habentis*, till a proper person appeared to administer the estate. Not only great frauds in this respect were said to prevail, but the creditors of the deceased could not obtain payment of their just debts, no one appearing to administer and no one being authorized to act in the premises, and thus again I ventured to address His Excellency in Council on the 1st and 23rd of January, on the 6th and 18th of February and the 1st of March, 1802, and I now beg leave for further particulars to refer to the said letters, and their several and respective enclosures, which are I believe, sir, on record in the office of the chief secretary to the Government at Fort Willam.

9. On the 6th May 1802 I had the honor of receiving a letter, dated 28th January 1802, signed C. R. Crommelin, Secretary to the General Public Department, informing me, by the directions of the Honorable the Vice President in Council, that all my letters should be addressed to the Lieutenant-Governor, on whom it would depend if he should deem it proper to transmit them to Government with such observations as he might judge it to be necessary to submit respecting them.

10. On the 7th of May 1802 the Lieutenant-Governor requested my attendance at the Government House, and there communicated to me the contents of a letter addressed to the Lieutenant-Governor, by the direction of the Honorable the then Vice President in Council, dated February 1802 and signed C. R. Crommelin, Secretary, by which letter the Lieutenant-Governor was desired, with the least possible delay, and with the assistance of the judge and magistrate, to prepare and transmit, for the approval and confirmation of his Excellency in Council, (without waiting for the completion of the whole code thereby required) drafts of such laws and regulations, as most urgently required legal provision. Even on this occasion, the Lieutenant-Governor did not honor me with any communication of his sentiments, but preserved such a solemn silence on the subject of our mutual labors, that I confess I was at that time greatly surprized. Yet as Mr Secretary Crommelin's letter had informed me that no communication was to be made to his Excellency in Council, but what the Lieutenant-Governor deemed proper, I contented myself with drawing "A regulation for the punishment of certain crimes and misdemeanors therein mentioned and which should or might be committed, at any time after the due promulgation of that regulation, by any person or persons therein particularly mentioned and des-

cribed at Prince of Wales's Island, the islands and the territory thereto subordinate, and the high seas within the limits and jurisdiction thereof" and another regulation—"For the establishment of an efficient Police at Prince of Wales Island, the islands and territory thereto subordinate" and as the Lieutenant-Governor did not make any voluntary communication of his sentiments on the subject mentioned in Mr Crommelin's letters, the Judge and Magistrate did not think it either respectful to the Lieutenant-Governor, or fit for the Judge and Magistrate to intrude upon the Lieutenant-Governor, when the Judge and Magistrate was at the Government-House, his unrequired sentiments on that subject. But on the 1st June 1802, I addressed a letter to the Lieutenant-Governor, conveying at large my sentiments on the subject of the Civil Code required by Mr Secretary Crommelin's letter, and transmitting at the same time the drafts of the two aforesaid regulations and requesting that the Lieutenant-Governor would transmit a copy of my letter of the 1st of June 1802, and the drafts of the aforesaid regulations (if he deemed it proper so to do) to His Excellency in Council. In my letter of the 1st June 1802, (having detailed at large my ideas on the subject) I then also requested that the Lieutenant-Governor would furnish me his specific instructions for the Civil Code, or that he would generally refer the subject for the decision of his Excellency in Council, as to the principles upon which it was to be framed. To that letter of the 1st of June 1802, the Lieutenant-Governor did not deem it proper to return me any answer, no, not even an acknowledgment of its receipt, and to this hour I am ignorant whether he has or has not transmitted it or the aforesaid regulations, to his Excellency in Council, the Lieutenant-Governor having ever since that time preserved an Altum Silentium on the subject.

11. When the Lieutenant-Governor was about to return to For William, that is on the 20th of November 1802, I again addressed to him a public letter respecting at large the inconveniences resulting to the society here settled, from the want of fixed Civil Laws, and praying that the Lieutenant-Governor would be pleased to lay those inconveniences before his Excellency in Council. I am at this day ignorant whether the Lieutenant-Governor has complied with the wishes of the people and my request, for on this subject also he has preserved an Altum Silentium.

12. I now come to the time when Mr Phillips, Secretary to the Lieutenant-Governor, took charge of this Government. The Lieutenant-Governor left this island on the 2nd of December 1802, and the late Acting Lieutenant-Governor, on the 18th of December 1802, of his own authority promulgated a regulation, which, on the 2nd of April 1803, he required of me as Judge and

Magistrate of this island, to receive in the Court Adawlut as the Law of this island, and to account thereon in a criminal case wherein a man of the name Carni was charged with theft previous to the promulgation; that is to say on the 14th of December 1802. I was consulted by the late Acting Lieutenant-Governor on the subject of passing such a regulation, and I then gave my opinion that the Acting Lieutenant-Governor had not any legal power to promulgate any such regulation as Law, previous to its being approved and confirmed by His Excellency in Council, and on the 3rd April 1803, I had occasion to repeat that opinion in a public letter that day written by me to the late Acting Lieutenant-Governor. On the 5th of April 1803, the said Carni was tried before me as Judge in the Criminal Court, and acquitted of the said charge alleged against him, which upon the general principles of evidence received in the Courts of England and on the Continent of Europe not could justifv a verdict of guilty. The late Acting Lieutenant-Governor after Carni had been tried and acquitted before me as aforesaid, sent for Mr Mannington his 2nd assistant and examined him at the Government-House in the absence of Carni; and then upon the 2nd assistant's deposition, found Carni guilty of offending against the said regulation of the 18th December 1802, and sentenced Carni to four months imprisonment and hard labour on the public works,, and the late Acting Lieutenant-Governor actually carried that sentence into execution. As the late Acting Lieutenant-Governor heretofore has informed me that he should transmit the proceedings in the case of Carni and the correspondence between us on that subject to his Excellency in Council, it is only necessary for me now to remark that I refused to receive the late Acting Lieutenant-Governor's regulation of the 18th December 1802, as a law in the Criminal Court of Justice in which I sat as Judge; first, because it had not been approved and confirmed by His Excellency in Council, and secondly, because it appeared to me unjust, unreasonable and repugnant to the laws of the realms of England.

13. On the 21st of April 1803, the Acting late Lieutenant-Governor addressed to me a public letter, stating that in order to prevent delay in the prosecution of Revenue causes at present unavoidable (as it was then said) in the Adawlut from the multiplicity of business brought before that Court, the late Acting Lieutenant-Governor had thought it expedient to insert a clause in the regulations for the farms of the approaching official year, signifying that all such causes would in future be heard by the first Civil Assistant, or such other officer of government as the Lieutenant-Governor might nominate for that purpose, whose proceedings would be submitted to the Lieutenant-Governor for his sanction and approval, and on that occasion I thought it my duty to state in reply, that the clause referred to appeared to me likely to affect the

dignity and efficiency of the office of Judge and Magistrate, and the purity of the administration of Justice on this island, and I now desire to state for the information of His Excellency in Council that there were no causes at that time in arrear in the Court of Adawlut, that I had never complained to the late Acting Lieut-Governor of want of leisure to hear revenue causes, and that from circumstances I am induced to think the reason assigned, that is to prevent delay, was merely ostensible. I beg leave also to submit to His Excellency in Council, my opinion on the spirit of this clause, which seems contrary to the principle on which approved writers state Revenue laws should be framed, which is, that justice should be the primary and revenue only the secondary object of such laws; to effect this, the Judge should be as independant as possible of both the parties to a revenue cause. But in a question between a farmer of the revenue and a subject of the Government, the farmer of the revenue always represents that if he is not supported in his prosecution of abuses, he will be unable to pay his rent, and although the farmer of the revenue is the nominal complainant, it generally happens in point of fact that the interest of the Government is involved in the cause. I cannot therefore think that justice was likely to be better administered in revenue causes, by an assistant of the Lieut-Governor (whom I do not mean in any manner to disparage] than by a judge who would act independently of the orders of the Lieutenant-Governor.

14. I now come to the period when the Lieut-Governor returned to this island, on the 12th of May 1803, and I have flattered myself that he would have returned with a Code of laws and regulations. When I was disappointed in this hope, I still ventured to think that from his known access to his Excellency, the Most Noble the Marquis Wellesley, I should at least have received some communication from the Lieut-Governor, making it easier for me to proceed in the laborious task of deciding in the court of Adawlut such causes as are the subject of positive law and not of the law of nature, but again I was disappointed. I testified the greatest respect to the Lieutenant-Governor on his return to this island on the 12th May last, but it was impossible for me not to observe the marked coldness with which upon my first visit of ceremony I was received by the Lieut-Governor. I lamented the cause, for I supposed the late Acting Lieut-Governor had (previous to the Lieut-Governor's disembarkation) communicated our correspondence in the cause of Carni, and to this communication I imputed my cold reception by the Lieut-Governor. But whatever were my private feelings, I did not suffer any other consideration than that of public duty to influence my public conduct as judge. The case of Hough soon afterwards (on the 21st of May) occurred. Hough was accused of theft, and tried before me

and acquitted, for the same reason that Carni was acquitted, the charge not being proved—and the Lieut-Governor did in Hough's case what the late Acting Lieut-Governor had done in the case of Carni. I therefore thought it my duty to request the Lieut-Governor to lay before His Excellency in Council a copy of the proceedings in Hough's case, but as the Lieut-Governor did not deem it proper to communicate to me whether or not he would according to my request transmit the proceedings to His Excellency in Council I am ignorant of his intentions herein. I further beg leave to state for the information of His Excellency in Council, that on the 2nd of June 1803, the case of Palongee versus Tyang came on before me in the court of Adawlut, and the plaintiff's bill was dismissed. But the Lieut-Governor afterwards directed the defendant to pay a sum of money into the treasury, and actually administered to the effects of one Etherjee deceased (named in the plaintiff's bill) without any communication with the judge on the subject, the Secretary of the Lieut-Governor giving his directions immediately to the provost.

15. On the 7th of June 1803 the cause of Cauder and Ebrahim came on before me in the court of Adawlut, and the proceedings of this cause with the correspondence between the Lieut-Governor and the Judge and Magistrate (as I understand) by the Lieut-Governor will be herewith transmitted. In this case it will appear that a question incidentally arose on a paper promulgated on the 1st of May 1800 by the Lieut-Governor, which paper was entitled—" Instructions to the native captains," and it will appear, that the Lieut-Governor thought proper, after a period in the cause, to depart from the accustomed mode of delivering judicial opinions and directed his secretary to write me a letter in which I am addressed rather as if I was an assistant to the Lieut-Governor, and subject to his orders, than as judge and magistrate of this island; and in which I am questioned as if I had committed some fault, by omitting some act which I ought to have done, and which seems to have been some act supposed necessary to give effect to the Lieut-Governor's instructions to the native captains. But on this head I beg to refer to the letters themselves which will show the facts. By Mr Secretary Phillips' letter dated 14th June 1803, the Lieut-Governor has charged the judge and magistrate in discussing this incidental question (originally raised in the cause of Cauder versus Ibrahim, and reviewed in the correspondence) with making improper and unbecoming observations, and by Mr Secretary Phillips' letter dated the 17th June the Lieut-Governor has charged the judge and magistrate with writing to the Lieut-Governor with an evident design of conveying disrespect to him, and the Lieut-Governor has therein declared his intention of submitting the proceedings in the cause of Cauder versus Ibrahim and the correspondence on the incidental questions

which then arose to His Excellency in Council. It is therefore that I now request that you will assure His Excellency in Council that I am absolutely incapable of such weak, unmanly and unbecoming conduct as the conduct imputed to me, that is to say, of intentionally writing in my official character of Judge any thing unbecoming, improper and disrespectful to the Lieutenant-Governor. That I feel assured His Excellency in Council will consider my language, though manly and firm, yet to be decent and respectful and such as became the Judge and Magistrate to write on that occasion. Permit me to add, that I felt myself bound by every sense of duty and gratitude to His Excellency in Council (who had done me the high honor of appointing me to the office of Judge and Magistrate and of recording to my credit the reason of this appointment) to resist every indignity offered to the office of Judge and Magistrate. And I beg of you to assure His Excellency in Council that if I have erroneously viewed the subject by being placed too near it, that I have only to answer for the impression of my language, for my intention certainly never was to write any thing disrespectful to the Lieutenant-Governor, and I trust the conduct I have observed ever since my appointment to the office of Judge and Magistrate will repel this accusation. On this head, I appeal to the Lieutenant-Governor himself, and I am not afraid the Lieutenant-Governor can object to my misconduct of any kind,—if he can I do not on this occasion implore his forbearance. But I greatly lament that the necessary effect of the treatment I have lately received, may be to bring my jurisdiction into contempt and to throw suspicion upon my character.

16. I beg of you, Sir, to assure His Excellency in Council, that nothing less than an occasion in which the welfare of this society and my own character are involved would have led me to take up so much of his time, as must be consumed in the hearing the contents of this letter. But on the letter itself this apology must rest, if the contents have not the importance which I annex to them, I confess I am without any other apology.

I have the honor to be, &c. &c.

(Signed) J. Dickens,
Judge and Magistrate of the Settlement of Prince
of Wales Island and dependencies.

The following angry correspondence on a subject of no great moment, between the Judge and Magistrate and the then government of the island, will be read with some interest in these days of full liberty of the press:

To the Hon'ble P. Dundas, Governor and President, and the Members of the Council of the Presidency of Prince of Wales Island.

Hon'ble Sir & Sirs,

I have the honor to receive about 3 o'clock P. M. on Tuesday the 25th November instant, a letter signed T. Raffles, Acting Secretary to Government, dated Fort Cornwallis, the 25th November 1806, addressed to John Dickens, Esq., Chairman, W. E. Phillips, Jas. Scott, J. P. Hobson, James Carnegy, and G. Seton, Esquires, the Committee appointed at a General Meeting of British Inhabitants of Prince of Wales Island. And I immediately sent a servant to carry this letter to the several gentlemen for their perusal, who signified that they had read it, by writing the word "Seen" above their names on the envelope of the letter.

2. I find at the close of the second para. of the Acting Secretary's letter, as follows "I am directed to request that you will state for the information of the Hon'ble the Governor in Council, whether &c. &c. &c." But considering that *as a Committee*, the gentlemen to whom that letter is addressed no longer *exist*, I am not aware how *as a Committee* they can reply to that letter.

3. Impressed however with a sense of the respect due to every communication which comes from the Hon'ble the Governor and Council, as an *individual* I was desirous of communicating without delay all the information I could have procured or possessed on the subject concerning which the Hon'ble the Governor and Council have deemed it expedient to enquire, and for the purpose, I applied to the Printer of the Government Gazette for the copy of the proceedings at a general meeting, of which I was chairman on the 10th November instant, written with mine own hand, and signed with my name, and which in compliance with the Printer's request, I had transmitted to him for publication.

4. But to my astonishment I found that this copy according to the statement of Mr Raffles was before the Governor and Council, and that he would, *if he could*, send it to the Printer in the course of the morning of November the 26th instant.

5. Expecting to receive this copy written with my own hand, (as I am not aware of any act committed by me which could justify the precaution of not again putting it in my possession) I did not immediately take any other steps towards replying to the letter of your Hon'ble Board. But having waited till the forenoon was spent I applied to the Printer again for this copy, who had applied for it to Mr Raffles, but who did not think proper to return it to him.

6. Mr Phillips however, about 1 o'clock P. M. of this day, did me the honor of calling on me, and of stating that the Hon'ble the Governor had been pleased to permit him to receive it from Mr

Raffles, on condition that after I had *inspected* it, the copy was delivered out to Mr Raffles.

7. Having inspected the copy of the proceedings &c I have now the honor of transmitting *my individual* reply to the letter addressed to me as chairman, and the other gentlemen, who were members of a late committee now *defunct*.

8. And before I even state the contents of the letter, to which I am to reply, I feel it a duty which I owe to myself, to protest against the smallest intention of offending against the profound respect due to the Hon'ble the Governor and Council, because, as it is impossible for me to agree in opinion with the Hon'ble Board on the matters stated in the Secretary's letter, I am anxious that difference of opinion should not be construed into quite another thing—disrespect.

9. Mr Raffles' letter states that the attention of the Hon'ble Governor and Council having been drawn to the publication, in the last Government Gazette, of the answer of Sir Thomas Troubridge to the address of the British inhabitants of this settlement, wherein the "*removal of restrictions on trade*" is noticed, which expression is in the Gazette inserted in Italic characters, thereby giving the reference to this part of the *subject* a *stronger* bearing than they are convinced His Excellency *meant* to apply, and having called on the Printer to state if the expression therein alluded to was so accented in the copy from which the pres was composed or not, he in answer furnished a written copy (not the original furnished by Sir Thomas Troubridge) *in which it is so accented*. So far in the opinion of the Hon'ble the Governor and Council, the Printer is *justified*, but seeing that it is not the original, and that in the Committee who furnished this copy there are found the names of Mr Phillips the Collector and Mr Hobson the Accountant General, both senior servants of this establishment and who by the appointment of the Hon'ble Court of Directors stand second and third for promotion to a seat at the board of Government, he, Mr Raffles, was directed to request, that *you* will state for the information of the Hon'ble the Governor and Council whether *in the original answer to the address* the expression is so accented or not, or if altered, by whose authority it has been done?

10. In reply, I humbly beg leave to lay before your Hon'ble Board the fact, that I really never gave any directions to the printer of the Government Gazette to insert in italic characters, the words "removal of restrictions on trade" nor did any one else to my knowledge give him any such directions. And if your Hon'ble Board should be pleased to enquire into this fact, the printer will corroborate this statement.

11. But your Hon'ble Board having been pleased to state in Mr Raffles' letter, to which I have the honor to reply, that "the

written copy of the proceedings from which the proofs was composed furnished you by the printer had the words 'removal of restrictions on trade' *so* accented, that is accented, in italic characters"—it became absolutely necessary for me to inspect again that copy, which was written with my hand, and signed with my name, and your Hon'ble Board (*through the Hon'ble the Governor*) having been pleased to *allow* me again to inspect it, I beg leave to say, that I cannot perceive in that copy the words "removal of restrictions on trade," to be accented in any manner whatever, according either to the scientifical or popular meaning of the word "accent."

12. I have carefully compared *that copy* written by me, with the original answer to the address transmitted to me by His Excellency. There is no alteration in *the expression* whatever in that copy. It is the same as the original, except that in the copy a line has been drawn with a pen under the words *removal of restrictions on trade,* which line is not drawn under those words in the original answer to the address.

13. I do not know who drew that line, I am quite unconscious of having drawn it, but as I understand the printer declares it was there when *the* copy was sent to him, I take it for granted I drew that line, particularly as your Honorable Board well knows, I am in the habit of drawing a line under matters which arrest my attention.

14. But your Honorable Board, I am persuaded, will not after this statement, conclude that this line directed or insinuated to the printer to print the words "removal of restrictions on trade" in italic characters; if however such an idea should, contrary to all probability, be entertained, it is quite easy to establish, by just reasoning, that it could *not* have this effect. For if a line was necessarily to be drawn to indicate or to *insinuate* to the printer of the Gazette, that words were to be printed in italic characters, no words of course should have been so printed in the proceedings of the committee, unless they were distinguished by a line drawn under them. But in the copy of the proceedings written by me in the possession of your Hon'ble Board, there is not any line drawn under any other words but the words "removal of restrictions on trade," while in the Gazette, the place, the date, the titles to the address, and to the answer to the address, and the word "depôt" are also printed in italic characters. In thus reasoning, it will soon appear I am not playing the part of an advocate *for myself*, for I am no more concerned on this occasion than your Hon'ble Board. But I feel it my duty as a public man, called for in the manner I have been, broadly and openly to meet the question which your Hon'ble Board have been pleased to raise on this subject. And with this view I should wish the printer to inform your Hon'ble Board, "Why he printed the

place, the date, the titles and the word depôt in italic characters as well as the words 'removal of restrictions on trade."?

15. May I without disrespect to your Hon'ble Board presume to question *the fact*, "Whether printing words in italic characters gives them (as your Hon'ble Board have taken for granted, what remains to be proved,) a stronger bearing."—Undoubtedly that is not the use to which I have always understood italic characters have been put when some words are printed in these characters, while the text is in another tope. I have hitherto conceived the use of the italic character is simply to *attract* "the eye" and through that organ "the *mind*" of the reader to the *words* so printed, but to attract the mind of the reader is not to alter the *expression* of the words so printed,—or to give them a stronger bearing.

16. And may I without disrespect to your Hon'ble Board, as a judge filling an important station under your Government, solemnly declare it as my opinion, that a printer requires no *justification* for using a type which is best calculated to *attract* the *minds* of his *readers* to the subject be prints. For if the *subject matter* be such as ought *not* to be presented to the public eye, the persons who introduced this subject matter in *whatever manner printed*, are the only responsible persons. If the subject matter then which has occasioned this enquiry by your Hon'ble Board, ought not to have been printed in the Government Gazette, to whom is the blame imputable of its having been thus printed in any type? and afterwards *published* to the world.

17. I have taken the trouble (for the purpose of giving every information in my power to your Hon'ble Board) to ascertain, by whose permission any article is inserted in the Government Gazette, and I find that nothing but matters of course *can be inserted*, without the *orders implied* or express Imprimature of your own secretary, and I have received from the printer of the Gazette this information on the subject of your enquiry—"In the *proof* sheet of the press sent to Mr Raffles, the words 'removal of restrictions on trade' were printed in *italic characters*. I did did transmit the *proof* sheet of the Gazette, *under cover to the acting Secretary to Government*, which was returned without the least alteration or observation with respect to the address. *As it is not customary to request the Secretary's approbation, no answer could be returned*. The publication of the proceedings on the address and answer was precisely the same as the proof sheet transmitted to Mr Raffles. I did not receive nny directions whatever from Mr Dickens or any body else respecting the mode of publishing the proceedings &c. &c. &c."

18. If then the proceedings on the address ought not to have been printed, or if (as your Hon'ble Board has intimated) the words "removal of restrictions on trade" ought not to have been

printed in italic types, to whom, but *to your own Secretary*, can you attribute that these proceedings were printed, or that these words were printed in *italic types*, by which too strong a bearing in the judgment of your Hon'ble Board has been given to these words; sure I am, that (while truth and justice preserve their empire over your honorable minds,) none or any of these things can be attributed to me, who have studiously avoided in any manner interfering with any of the concerns of your Government *but in these matters which respect* and *are essential to the purity of the administration of justice*. I was led only by my high admiration of the gallant admiral, to attend the public meeting at which the good opinion of the inhabitants of George Town on the spot, invited me to preside as *Chairman*. If in accepting this invitation I have tresspassed on decorum, when I recal to your minds the gallant deeds of that Illustrious Hero I am sure to find in them a sufficient appology. But to speak the plain truth, I do not think any apology is necessary and I shall not therefore intrude any unmeaning words upon your Hon'ble Board.

But before I conclude, I beg leave to state that in consequence of your Hon'ble Board having been pleased to authorize your Secretary to state, "That you *were convinced* printing the words 'removal of restrictions on trade' in *italic characters* gave to these words a *stronger bearing*, than *His Excellency meant to apply*" I thought it a duty to myself and His Excellency *to ascertain His Excellency's opinion* on that point, that the fact might be presented to your Hon'ble Board, and I feel myself warranted in writing that His Excellency meant to convey the *genuine* meaning of the words, "removal of restrictions on trade" in the sense in which they are generally understood *by reflecting, considerate, minds*.

I have &c.
[Signed] John Dickens,
Late Chairman of a General Meeting of the European inhabitants of George Town &c. and Judge and Magistrate of Prince of Wales Island.

P. of W. Island,
George Town,
November, 28th 1806.

To Thomas Raffles, Esquire,
Acting Secretary to Government.

Sir,

Mr Bone informs me that that he was *desired* by you to state what follows in this day's Gazette—viz:

"We have also to correct an omission in not having subjoined the signature of the Chairman of the Committee."

And refers me to you, for an answer to a question I put to him "upon what authority he inserted that paragraph."

2. I therefore call upon you distinctly to tell me, upon what authority you took the liberty of desiring the printer to insert anything in the Gazette respecting *me* without my previous approbation and *permission*, and also to tell me whether you did so in your *private* character of Mr Raffles, or in your *public* character of acting Secretary to Government.

I have &c.
[Signed] John Dickens,
Late Chairman of a late Committee of the
European Inhabitants &c. &c. &c.

George Town,
P. of W. Island,
November, 29th 1842.

To John Dickens, Esquire.

Sir,

I have to acknowledge the receipt of your letter of this date, requesting I will tell you by what authority I desired the printer of the Gazette to insert any thing respecting you without your previous approbation and permission, and whether I did so in my private or public character.

In reply to which I am directed to inform you that the instructions to the printer were given by me in my public capacity of acting Secretary to Government, and in pursuance of the directions I had received from the Hon'ble the Governor.

I have &c.
[Signed] T. Raffles,
Acting Secretary to Government.

Fort Cornwallis, the 29th November 1806.

To the Hon'ble Philip Dundas,
Governor and President and the Members of the Council
of the Presidency of Prince of Wales Island.

Hon'ble Sir, and Sirs,

No man laments more sincerely than I do, that the words "removal of restrictions on trade" were through the inattention of Mr Raffles (what the Hon'ble the Governor and Council must have expected from him, when they made him licenser of the press) printed in italic characters. It may be true that Mr Bone thoughtlessly conceived, the line scored under those words was intended as directions to print them in italic characters. But as he printed the word "Depôt" in the reply to the address in italic characters, when no line was scored under that word, I have just right by the principles of reasoning to deny what is stated in this day's Gazette—"That these words were printed in italic characters '*in consequence*' of there having been a line drawn under them," and I take upon myself to maintain in truth and justice, that the facts of the case, as stated by me, in my letter to your Hon'ble Board of the 28th instant, and which cannot be impeached, do not warrant such a conclusion.

2. If, however, to distinguish the original answer to the address by printing a part of it in italic characters, was taking a liberty which required the previous authority of His Excellency, will it be denied that my consent was not requisite to print in italic characters, this passage in this day's Gazette—"We have also to correct an omission, in not having subjoined the signature of the Chairman of the Committee"?

3. I will not trouble you with any observation on the whole of the publication respecting the printing in italic "Removal of restrictions on Trade" in this day's Gazette, which also announces for the first time (although the report has been circulated upwards of six weeks) that a Chief Justice is proceeding to Prince of Wales Island. But it having been officially communicated to me, that the *Hon'ble the Governor* has directed all this publication respecting the printing in italic the words "Removal of restrictions on Trade," in truth and justice you, Honourable Sir and *Sirs*, cannot refuse to hear me in my own defence, after the Hon'ble the Governor has thus punished me on *his own accusation unheard*. *Castigatque, auditque*—was by the ancients considered harsh. To deny me a hearing both before and *after* punishment would be harsh indeed.

4. It is true that the judgments of the Court over which I preside, are under the control of the Hon'ble the Governor and Council. It is also true that the press is under the control of the Hon'ble the Governor and Council. But I do not know, that it is true that the Judge and Magistrate of Prince of Wales Island is under the control of the Hon'ble the Governor *individually*, whatever may be the other prerogatives attached to the dignified station which he holds in the Government of this island. Any Judge under the direct control of a Governor of an island, circumstanced as Prince of Wales Island is circumstanced, might be made liable to a bias destructive of his duty. He might be compelled to prostitute the dignity, limited as it is, and betray the sanctity of his office. Any act then which indicates such control, must raise suspicion in the minds of the Community. And if the administration of justice should be unsuspected, any act which indicates control over the Judge is injurious to the administration of justice. May I then without disrespect to you Hon'ble Sir and Sirs—appeal to your wisdom and justice, if the publication in this day's Gazette, respecting the printing in italic the words "Removal of restrictions on Trade"—does not indicate an act of direct control exerted

by the Governor as an individual over me the Judge and Magistrate of this island. And may I without disrespect ask —how could it concern the Hon'ble the Governor, that my name was omitted to be printed at the end of the proceedings on the address to His Excellency Sir Thomas Troubridge? And why the Hon'ble the Governor exercised this act of control when the aforesaid subject of the words "Removal of restrictions on Trade" being printed in italic, was yet depending as a matter to be determined by the Hon'ble the Governor himself and *in the Council*? What purpose may I ask, had the Hon'ble the Governor to effect by this *premature* publication in a Gazette under the directions of Government, in this instance exercised by himself individually?

5. I do not pretend to say that my tranquillity of mind is at all affected by this act of control exercised over me by the Hon'ble the Governor *individually*; it at first excited considerable surprise —but it had no power to afflict. I have not to my knowledge in the proceedings on the address being printed in part in italic characters, done any act unbecoming me as a man or a Judge. And "he only is vulnerable who not having firmness enough or wisdom enough to avoid the commission of an unbecoming act, has yet feeling enough to be ashamed of it." I have a right to complain of the possible consequences that may ensue to the purity of the administration of justice from this act of control, and till the arrival of the expected Chief Justice, I shall endeavour to regulate my public and private conduct in such manner as to be able to defy the most unjust insinuations against either.

I am &c.
(Signed) John Dickens,
Late Chairman of a late Committee &c.
and Judge and Magistrate of Prince
of Wales Island.

George Town, 29th Nov. 1806.

Minute by the Hon'ble the Governor.

1. It is neither my intention nor my wish to enter into, or to call on the Board to support me in a paper war with the writer of the letters now read, which they may witness for me, I have generally rather expressed a wish to avoid than to promote, nor shall I take up the time of the Board in attempting to expose the sophistry of many of the arguments in that of the 28th of November which is drawn out to 18 closely written paragraphs, calculated by subtle reasoning to draw the mind and attention from the main point and only cause of our Secretary's letter of the 25th to the late Committee of the European inhabitants, viz: the desire the Board had to know by whose authority the words so often commented on were printed in the italic characters, thereby giving them a stronger effect than we had good reason to

believe they were intended by His Excellency Sir Thomas Troubridge to bear.

2. This simple fact might have been answered in two lines, and it has been satisfactorily answered in the 12 and 13 paras. of the letter in question, where Mr Dickens avows that the copy of the answer to the address by the Admiral which was sent to the Printer for his guidance, was written in his (Mr Dickens's) own hand, although he was not conscious of having made the line which attracted notice, but on comparing it with the original, finds there was no such line therein. Can there be a doubt of the fact in the mind of every fairly judging and candid man—the intention with which it was done is quite another matter, which no one can decide. But Mr Dickens disputes that the drawing this line necessarily induced the consequence of the Printer putting the passage so distinguished in the Italic character. I have always understood that a line under certain words in manuscript was equivalent to printing such in a different character by the *press*, but to ascertain this to a certainty in this particular case, and in compliance with the suggested wish of Mr Dickens in the conclusion of the 14 para. of his letter of the 20th, I desired our Secretary to call on the Printer and request him to answer the several questions following, which were noted at the time and are now annexed to each.

Question. Why did you print the place, the date, the titles, and the word "Depôt" in Italic characters?

Answer. It is customary for all addresses, dates, and places to be printed in Italics, to give a diversity of appearance to the press,—*see pages* 19 and 179 *Printer's Grammar.* The word "*Depot*" does not exactly stand in this shape, but being a foreign word, and not having any Roman accented letters to the fount of types, the Printer took that license, as it could not possibly affect the tenor or force of the expression, otherwise he would not have felt himself at liberty to do it.

Question. Why did you print the words "*Removal of restrictions on Trade*" in Italic characters.

Answer. My reason for printing the words "Removal of restrictions on Trade" in Italic was because they were marked so in the copy. By a single line being drawn under any particular passage, it denotes that part to be printed in Italics—vide Printer's Grammar, page 149.

In further justification of it so appearing in the Gazette, a printed proof of that part was previously sent to Mr Dickens, for his satisfaction that it was correct who returned it with these words—"I return the proof sheets which are correct, except where I have altered *of* into *to.*"

I presume then it is by the above most indisputably proved that the line by whomsoever and from whatever motives drawn, was the cause of the words noticed, having been printed differently from the rest of the page.

4. It is also evident that this alteration was made without the authority of the committee, though by the Printer's omission of the signature to the article in the Gazette, it did not so appear until explained by him.

5. Having then ascertained those three facts and seeing that our Council, through the indisposition of both my colleagues, could not meet on the Friday, I thought it my duty to desire the Printer to explain the circumstances of this Italic printing, which to me appeared highly necessary, as to my mind Sir Thomas Troubridge's expression, when so printed bore out, in stronger terms than he had meant, to the Supreme Government, to the Court of Directors and to the world, his opinion on such an occasion, one of some weight, that the existing government of this island had imposed or retained improper and injudicious restrictions on trade, whereas if left as he delivered it, it could only imply a difference of opinion from us, on the amount of duties on particular articles, a subject on which any two men may differ.

Against this *assumption* of individual authority as styled by him Mr Dickens has directed his most powerful efforts in his last letter, disputes my possessing such, and accuses me of having made an improper use of it on the present occasion. Now on this subject, I am desirous of having the opinion and sanction of the Board, for what man in his senses would undertake, in a place like this, the regulation of a press, or any other executive duty for a body of which he is at the head, if he is to be called on for his reasons by and to enter into personal altercation with every one, who may be or may consider himself hurt at his proceedings. With equal justice might the loser of a civil cause, be entitled to traduce the Judge who had given the decision against him, and in this case I do hope for the assistance and support of my colleagues, who must be sensible I could not assemble them in Council on Friday evening to judge the propriety of the proposed Gazette of next day when they in the morning had been confined by indisposition.

As to the announcing of the appointment of Mr Ormsby to be our Chief Justice here in the Gazette of the 29th, I hope I need hardly say that I had no hand in it, nor do I know from whence Mr Bone, took it, or why he did not insert it long ago; indeed, had I observed the article, I should most likely have recommended to him not to have inserted it on that day.

(Signed) P. Dundas.

To John Dickens, Esq.

Sir,

Having laid before the Hon'ble the Governor and

Council your letter of the 28th and 29th ultimo, I have their directions to inform you that the corrections of the press published in the Gazette of the 29th ultimo, were inserted with the intention of explaining that the words alluded to, printed in italics in consequence of a line having been drawn under them, did not in the opinion of the Governor and Council, originate with His Excellency Sir Thomas Troubridge, and that His Excellency did not mean to use the expression in the sense which their being so printed conveyed, and that the same were not inserted with the intention of injuring you in the estimation of any person, as your conduct in the administration of your office has met the approbation of Government.

Having by their directions stated thus much to you in explanation, which however it is not usual for them to do to any officer under their Government, I am desired to inform you that the Governor's motives and conduct in inserting them have met the fullest approbation of his colleagues, and which they virtually had at the time the corrections in question were published, which information they think it necessary that I should give you, because it appears to them that your letter of the 29th has been dictated as personal to the Hon'ble the Governor.

With respect to the para: relating to Mr Ormsby which you have alluded to, although not allied to the present subject, I am directed to inform you that the same was not inserted by the Governor and Council, or any person acting under their authority, such not being their practice.

I am &c.
(Signed) T. Raffles,
Actg. Secy. to Govt.

Fort Cornwallis,
The 2nd December, 1806.

To Thomas Raffles, Esquire,
Acting Secretary to Government.

Sir,

I have perused your letter in circulation addressed to John Dickens, Esquire, Chairman, W. E. Phillips, James Scott, J. P. Hobson, James Carnegy, George Seton, and Thomas Halyburton, Esquires, the Committee appointed at a General Meeting of the British inhabitants of Prince of Wales Island, in which as a member of that Committee, I am called upon by the Hon'ble the Governor and Council, to state whether in the original answer by Sir Thomas Troubridge, Bart, to the address of the British inhabitants of this island, the words "Restrictions on Trade," were accented or not;—or if altered in the copy of that reply sent to the Editor of the Gazette *by the Committee*, by whose authority it has been done.

2. In reply to these queries, I request that you will be pleased to state for the information of the Hon'ble Board, that when the Committee above alluded to, had in compliance with the request of the British inhabitants of this presidency, delivered to Sir Thomas Troubridge, Baronet, the address voted, that Committee was in my belief virtually dissolved, and since that moment have most certainly ceased to act as a body—if, therefore, any passage in the reply to the address has through inadvertence or otherwise in the mode of printing it in the Gazette conveyed a stronger bearing than the Hon'ble Board are convinced His Excellency meant to apply:—it has not been an act of *this Committee nor of mine individually.*

3. Under these circumstances and aware of the injurious impression that must follow the perusal of an official document of such high authority, and publicity as the Hon'ble Board's orders, in which I am by name implicated as inimical to the measures of this Government, I confidently and respectfully appeal to the justice of the Hon'ble the Governor and Council, to relieve my character from the implied censure now borne on their records.

I am &c.
(Signed) W. E. Phillips,
Collector of Customs and Land Revenues.

Fort Cornwallis,
The 30th Nov. 1806.

REMARKS ON THE SOUTH-WEST COAST OF CAMBODIA.

THE position of Pulo Ubi as given by Horsburgh appears to be nearly correct. It is a high hilly island, the highest summit appearing nearly in the middle when seen bearing East, with two saddle-shaped hills to the Northward, and a quoin-shaped one to the Southward.

Between this island and the main, there is a deep run of water 14 and 15 fathoms, shoaling gradually to 10 as the shore is approached, but after this it grounds up rapidly to 3. (In rounding to, to anchor to the Southward of the point in 6 fathoms, the Pantaloon swung into 3 fathoms.)

The tide runs through this strait with a velocity of 4 and 5 knots, but the rise and fall is very trifling, even in the springs, and seldom exceeds 4 feet. The banks to the Southward of this coast seem to be gradually extending, as Captain Welsh, of the Polka, who has twice adopted this channel in his passage to Kampot, tells me that with Pulo Ubi bearing W. ½ S. and distant 10 or 12 miles, he had soundings of only 3½ and 4 fathoms, and carried these depths until close up to the island. Many ships pass through without heaving the lead, (a precaution that should never be neglected in these seas,) from seeing the deep water marked in the charts.

Camao Point, or as it is called in Horsburgh's charts Mui Sha Kaoc, is in a transit with the highest part of Pulo Ubi bearing S. 30° E. (true). It is low and covered with trees, and has several ranges of fishing stakes off it, beyond which shoal water extends some distance. Several ships have grounded on this spit by hauling up too soon after rounding Pulo Ubi, and to avoid it it is necessary not to bring Pulo Ubi more to the Southward than S. E. by E. until round the point.

Camao river is in Lat. 8° 38' and Long. 105° 0' by an estimated distance. The soundings about 4 miles off are 5 fathoms, and by the natives' account there are 3 fathoms in the river's mouth. This I had not an opportunity of verifying. There seems to be but little trade carried on here, and the boatmen stated that all intercourse with European vessels was strictly prohibited by their Mandarins, and if such was known to have taken place the punishment was death.

The coast above Camao river is uniformly low and level, without any feature of interest, or any town of consequence until Teksia is reached.

False Pulo Ubi, or Man Noi is a moderately sized island, with two or three low hills on it covered with trees. It bears from Pulo Ubi N. 30° E. (true) distant 11 leagues. S. 29° E. from False Ubi (by a transit bearing) is another low island distant about 5 miles, to the Southward of which are some rocks and shoal water. The channel between these and the main land is safe with 7 fathoms about mid channel.

There are no more islands in the offing, until Pulo Dammer with its contiguous group of islets is approached. This island was formerly placed too far to the Southward, but having now passed it 10 or 12 times, I have had an opportunity of correcting its position. The highest peak is in Lat. 9° 40′ N., Long. 104° 22′ reckoned from Singapore Flagstaff, according to Ross. The name given by some of the natives to this island is "Patchow," but the greatest difficulty is experienced in ascertaining the proper names of the various places in this part, owing to the variety of languages in use.

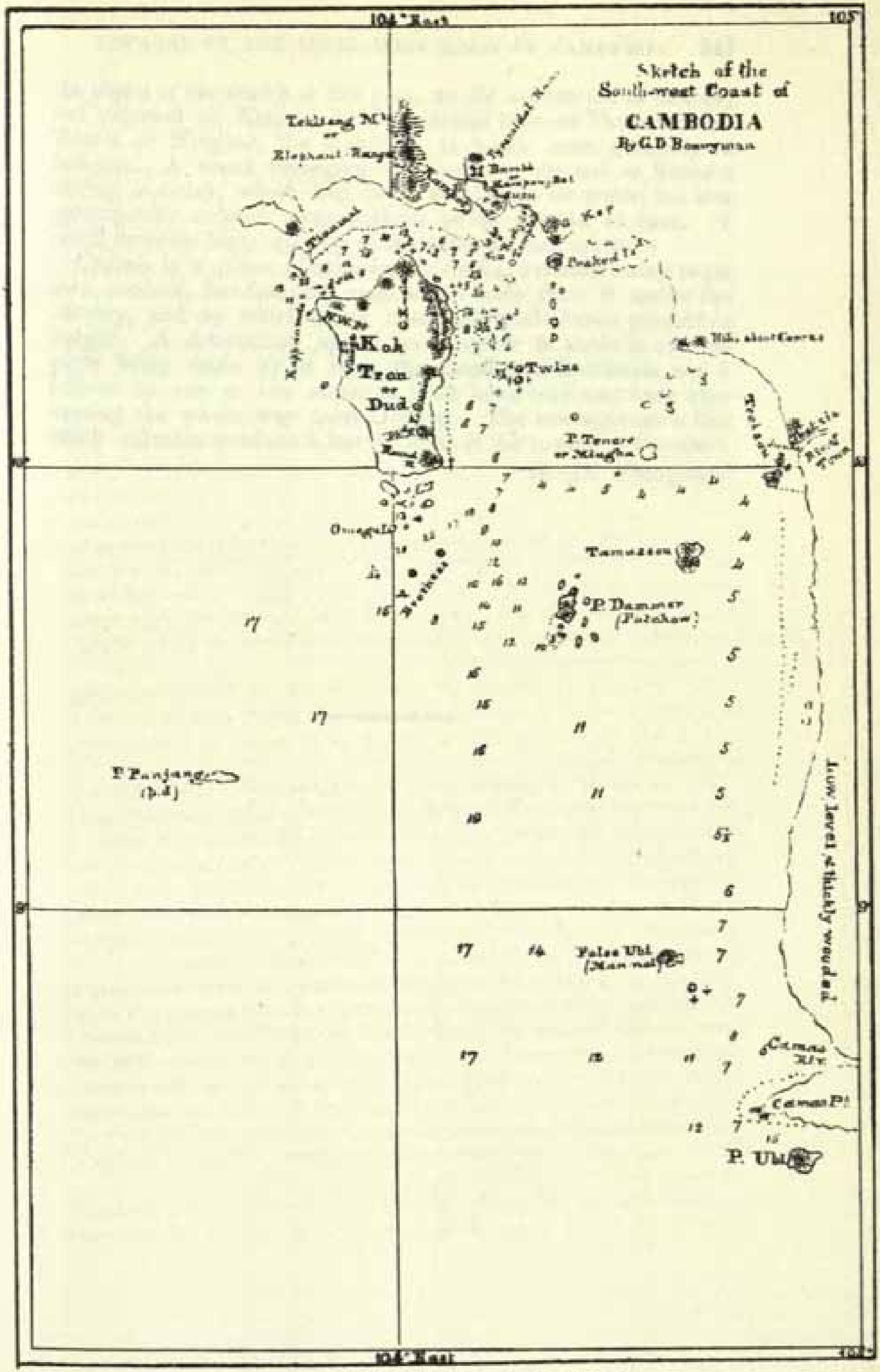
Having two boats engaged,—one from Cancao, the other from Camao, we found that their crews could not agree in any way about these names, and this perhaps accounts for many islands being laid down that do not in reality exist. It might tend in some measure to reconcile the differences arising from this cause, if a short list could be procured of the most common words in use, such as island, rock, mountain, cape, &c. in the various languages in use about these seas, as perhaps by the prefix or termination we might be able to tell to which language the name belonged, and thus form a judgement as to its being a *new* island, or another name for an *old* one.

The channel between Pulo Dammer and the Brothers leading to Kampōt is safe to beat through, but the *South* end of Dammer should not be approached within 5 or 6 miles, as a spit steep-to projects from it.

To the N. E. of Pulo Dammer is a large high island with two summits, the southernmost a flat table hill, and the northernmost peaked. On the south and east sides these hills descend steep to the beach, they are covered with trees, and the island appears to be uninhabited. The north peak is in Lat. 12° 48′ Long. 104° 40′. The name of the island is Tamassou. Between it and the main the soundings are 4 and 5 fathoms, and this is the channel generally adopted by Junks proceeding to Teksia and Cancao.

Teksia is a place of considerable trade, the river being large and running through a fine rice country, near the mouth is a high island called Teksou in Lat. 9° 58′ Long. 104° 51′. On rounding this island we came suddenly upon a fleet of upwards of 40 Junks at anchor, and as it is said to be a noted place for pirates, we took the precaution to arm the boats well before visiting them. They proved, however, to be trading Junks from various parts of China, and one or two were from Singapore. They were loading rice, which was generally procured by barter.

From this anchorage the hills about Cancao are seen, the land running in a bay to the N.W. As however we lost all traces of



Lith. Singapore Free Press Office.

the object of our search at this port, we did not proceed to Cancao, but returned to Kampōt by the channel between Tamassou and Texere or Hinghae, the soundings in which were generally 4 fathoms. A vessel belonging to Singapore arrived at Kampōt during our stay, which had called at Cancao for water, but was peremptorily ordered away without being allowed to land. I could however learn nothing of the route she had taken.

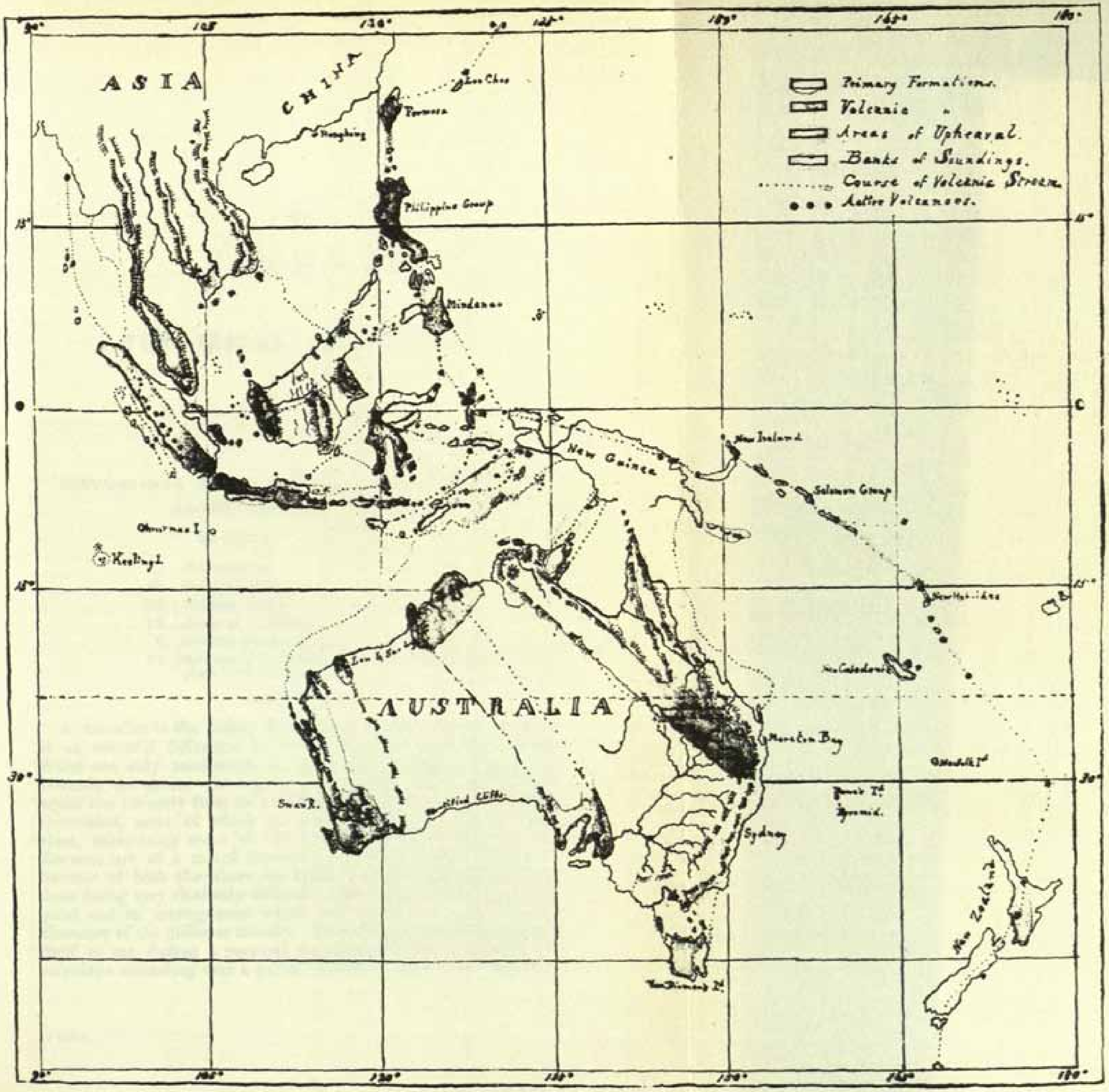
Cancao is a place of considerable traffic, not only owing to its own produce, but from the canal which leads from it across the country, and by which many boats and small Junks proceed to Saigon. A determined opposition however is made to any exports being made by it from the interior of Cambodia, and I believe on one or two occasions boats have been sent back after coming the whole way from Oodong. The consequence is that much valuable produce is lost for want of the means of transport.

G. D. Bonnyman.

LAND-LOCKED HARBOURS.

There are certainly not many such ports in the Indian Archipelago, but this very circumstance renders them the more valuable, and the European powers which possess territory in this part of the world, have repeatedly attempted to avail themselves of the advantages which they present for the formation of naval arsenals. The inner harbour of Amboyna, the capital of the Moluccas, is in every respect a perfect port, as far as security and convenience for shipping is concerned, while the anchorage abreast of the town, which is situated on the shores of the outer harbour, is exceedingly unsafe; indeed it is only near the fort, where a rocky bank extends a little more than a cable's length from the shore, that anchorage can be met with. This has induced repeated attempts on the part of the Dutch, during the last two centuries, to form arsenals on the shores of the inner harbour, but they were on each occasion obliged to desist, owing to the excessive mortality from fever that took place among the people employed. Strangers who visit the Indian Archipelago are often surprised to find that the land-locked harbours are neglected by the natives in favor of spots which present no palpable advantages. The chief commercial settlement on the island of Lombok, which is resorted to by hundreds of ships, is situated upon an open roadstead, not only exposed to the westerly gales, but subject at all times to a rolling swell, which causes so dangerous a surf upon the beach, that communication with the shore is sometimes cut off for days together. Yet there is a land-locked harbour within the distance of a few miles, which affords perfectly secure anchorage, and is accessible to ships of the largest size; but here again the climate is so unhealthy that its shores cannot be inhabited. The same rule applies to every spot similarly situated throughout the Indian Archipelago.

What may be the causes of the insalubrity of these land-locked harbours can only be judged by inference, for malaria does not admit of analysis. That it is engendered by mangrove-swamps and by mud-banks exposed at low-water, I have not the least doubt, but at the same time the action of strong tides must tend to remove the impurities which create it, otherwise both Singapore and Sourabaya would be unhealthy. I have reason to believe also, that the effluvia produced by the action of a powerful sun on stagnant salt-water is highly unfavorable to the constitution.—*Enterprise in Tropical Australia.*


90°
105
120°
135°
150°
165°
180°
15°
0
15°
30°
ASIA
CHINA
Loo Choo
Formosa
Hongkong
Philippine Group
Mindanao
New Ireland
New Guinea
Solomon Group
Christmas I.
Keeling I.
New Hebrides
New Caledonia
AUSTRALIA
Moreton Bay
Norfolk Id
Howe's Id
Pyramid
Sydney
Swan R.
Red Cliffs
Van Diemen's Id
New Zealand
Primary Formations.
Volcanic "
Areas of Upheaval.
Banks of Soundings.
Course of Volcanic Stream
Active Volcanoes.

THE
JOURNAL
OF
THE INDIAN ARCHIPELAGO
AND
EASTERN ASIA.

CONTRIBUTIONS TO THE PHYSICAL GEOGRAPHY OF SOUTH-EASTERN ASIA AND AUSTRALIA.

By GEORGE WINDSOR EARL.

I. *Introduction.*
II. *Primary Ranges.*
III. *Volcanic Bands.*
IV. *Areas of Upheaval.*
V. *General Conclusions.*
VI. *Influence of Geological Character on the progress of European Colonization.*

INTRODUCTION.

A traveller in the Indian Archipelago soon perceives that there is an essential difference in the structure of the various islands. Some are only moderately elevated, with the land sloping gently towards the shore, and regular soundings far out to sea. Others again rise abruptly from an unfathomable depth, and contain lofty mountains, some of which are active volcanoes; while a third class, comprising some of the larger islands, as Sumatra and Borneo, are of a mixed character, partaking in part of the peculiarities of both the others, the limits, however, of the two formations being very distinctly defined. The object of this paper is to point out an arrangement which will present at one view the character of the different islands. This arrangement has suggested itself to me during a personal acquaintance with the Indian Archipelago extending over a period of several years, and I feel that, had it previously existed, it would have very materially assisted me in pursuing the inquiries that I have lately had occasion to make in that part of the world.

The contrast which the volcanic islands of the Archipelago afford when compared with the continent of Australia is very strikingly presented to the view of a voyager from Port Essington, crossing for the first time the sea that separates the continents of Asia and Australia. Even before he has lost soundings on the great bank which extends from the northern shores of the latter continent, the lofty mountains of Timor rise up before him. As he nears the land the colour of the water suddenly changes from green to a deep blue; he has now passed the steep edge of the bank, and is floating on the unfathomable seas which bound the volcanic islands of the Archipelago. On closer examination, he finds that the land of Timor rises abruptly from the depths of the ocean, so much so, that from many of the precipices which overhang the sea, a line of great length will not reach the bottom, while the very few spots on which anchorage is to be found are so close to the shore as to be available only when the wind blows from the land. And to complete the contrast, if the weather is clear we perceive that one of the mountains near the east end of Timor is an active volcano.* The chain of islands which extends from Java to Timor is of the same character; lofty volcanic peaks, some in a state of activity; while the islands are separated from each other by narrow channels of unfathomable depth, through which the current from the Pacific, caused by the prevalence of easterly winds, rushes with great force; but on passing these the voyager again perceives a change in the colour of the sea from deep blue to green, and, on sounding, he finds a bottom of stiff clayey mud, resembling exactly that of the bank which fronts the northern coasts of Australia; he is now on the great bank which extends from the south-eastern extremity of Asia far into the seas of the Indian Archipelago. The islands now lose their volcanic character, and on arriving at Singapore, near the extremity of the Malay Peninsula, the general resemblance of the country to that in the neighbourhood of Port Essington is sufficient to strike the most careless observer. The land low and undulating; the shore with red cliffs alternating with sandy beaches; even the rocks of the red iron-stone known to Indian geologists by the name of *laterite*, are perfectly in character with the country of the Coburg Peninsula, and even on closer examination little difference can be discovered except in the vegetation.

These banks of soundings which extend from the continents of Asia and Australia, form very remarkable features in the geography of this part of the world, and, as such, are deserving of more attention than has hitherto been bestowed upon them, since it will be found that all the countries lying upon these banks partake of the character of the continents to which they are attached; while those which are situated on the deep sea which separates them are all of comparatively recent volcanic formation, with the exception of a few small coral islands, which, in all probability, are constructed upon the summits of submerged volcanoes.* The depth of water on these banks averages about 30 fathoms, deepening rapidly as the edge is approached, and shoaling gradually towards the land. It will be seen that the one I have termed the Great Asiatic Bank extends into the Archipelago from the south-eastern extreme of Asia to a distance of nearly 1,000 miles, in fact to within 50 miles of Celebes, and I strongly suspect that it will be found to extend to the south-western extremity of that island also; but as there is a space of nearly 30 miles across which no soundings have been carried, I have preferred reducing the bank to the limits for which we have actual data.

---

* *Vide post.*

Countries lying on the Great Asiatic Bank—The similarity that exists in the direction of the mountain ranges in the south-eastern part of Asia has often been the subject of remark. These invariably run in a direction nearly N. N. W. and S. S. E., and are all of the primary formation. The chain which extends along the Malay Peninsula is the most conspicuous of these ranges, and is continued at intervals to Banca and Billiton, and perhaps may be traced as far as the north coast of Java. It is this range that most abounds in metals, or, at all events, in which mining operations are pursued with greatest success, probably from the strata, owing to its central position, having been little disturbed by the convulsions which have shaken the countries on either hand. The productiveness of the gold mines of the Malay Peninsula and of the tin mines of Banca is well known. This range may be considered as the back-bone of the Great Asiatic Bank. Sumatra, which lies on its western verge, has been subjected to volcanic action, but not to so great an extent as to disturb the direction of its mountain range, which runs parallel to that of the Malay Peninsula. The third and last range that can be traced into the Indian Archipelago is the one that traverses Laos and Camboja, at the southern extremity of which it disappears for a time, showing itself only at Pulo Condor and the Natunas, until it emerges near the north-west extreme of Borneo, and is continued along the entire west coast of that island. Here it again disappears, and only shows itself again on the north coast of Java, where it ceases entirely; the remaining portion of this island, with, perhaps, a part of the north-west extremity, being either of volcanic formation or of alluvial deposit. It is rather singular that the celebrated teak-tree, which abounds on the Cambojan part of this range, but is not found in Borneo, is again met with here, the projecting part of the north side of Java, between Samarang and Surabaya, being a vast teak forest, from the timber of which the greater portion of the shipping employed in the Archipelago is constructed. Java is the only island in the eastern seas in which the teak-tree is indigenous, nor will it thrive in the volcanic parts of the island where its cultivation has been attempted. This, which we may call the Cambojan Range, is also rich in minerals, especially the Bornean part of it, where large quantities of gold and many diamonds are obtained by the miners. The *volcanic* islands of the Archipelago also contain metals, gold-dust being found at the bottoms of many of the mountain streams, but it does not exist in *veins*, as in the Malayan Peninsula and on the west coast of Borneo, these having apparently been broken up by the violent convulsions to which these islands have been subjected. The metal is therefore only obtained from the bottoms of the mountain streams, where it has been deposited when the earth in which it had been contained was washed away.

---

* Since the above was written, I have seen Mr Darwin's essay on the "Structure and Distribution of Coral-reefs", in which it is satisfactorily shewn that "Atolls" or annular reefs were originally fringing reefs constructed around islands that have since subsided.

Volcanic Islands of the Indian Archipelago.—The lines of volcanic action to which these islands have been subjected can be traced with tolerable distinctness. One of these extends along the W. coast of Sumatra and the S. coast of Java, whence it is continued by a chain of islands, separated by narrow but deep channels, to New Guinea, and can be traced through that island to the Louisiade Archipelago, and is probably continued by New Caledonia and Norfolk Island to New Zealand thus forming a curved line resembling the letter S. The other line commences in Kamtschatka and extends through the Kurile Islands, Japan, and Loochoo, to the Philippines, where it separates into two branches, one traversing Palawan and the N. W. part of Borneo, where it terminates near the limits of the Great Asiatic Bank, and the other continuing in a southerly direction until it comes in contact with the Sumatran line. It is near this point of contact that the volcanic action has been strongest, throwing the islands into fantastic forms, of which Celebes and Gillolo furnish striking examples. These islands all rise abruptly from an unfathomable sea, a circumstance unfavourable to their productiveness, since a large portion of the rich soil created by the decomposition of the volcanic rock is washed away into the ocean. Java, however, is in a great measure exempt from this disadvantage, owing to the Great Asiatic Bank extending to its northern coast, which prevents this soil from being lost, in lieu of which it is deposited in vast plains lying between the mountain range and the sea. These plains are so surpassingly rich, that they not only yield a sufficiency of grain for the consumption of a large portion of the population of the Archipelago, but at the same time afford such abundance of sugar and other tropical produce as to furnish cargoes for many thousand tons of shipping.

The Great Australian Bank.—The remark that has been made with regard to the ranges in the south-eastern part of Asia is equally applicable to Australia, since one of the most marked features in the geography of this continent is the uniformity that exists in the direction followed by all the continuous mountain ranges that have yet been discovered. The Darling range on the W. coast of Australia, the great chain that extends along the N. E. coast, with the range that traverses a portion of South Australia, and in which metallic ores have lately been found in such abundance, pursue a direction nearly N.N.W. and S.S.E.; and although the ranges on the E. coast of New South Wales vary somewhat upon this point, it is still to so slight a degree as not to require any particular remark. That this rule is also applicable to the lesser ranges is proved, at least as far as the shores are concerned, by all the deep inlets on the coasts of Australia preserving the same general direction, that is, running parallel to the mountain ranges; indeed so generally is this the case, that there is scarcely even a deep bay throughout the entire coast that does not conform to the general rule. The same occurs in Van Diemen's Land; indeed this island must be considered as being a portion of Australia, for, although really insular, being surrounded by water, it is still joined to the continent by a bank of soundings on which there is a depth of from 35 to 40 fathoms.

The great bank which fronts the N. and N.W. coasts of Australia commences near the N.W. cape, and extends in a N.E. direction to New Guinea, where it terminates at the base of the high but narrow mountain range that unites the eastern and western parts of that island, and separates the Banda Sea from the Great Pacific. It is at this point that the edge of the bank is most remote from Australia, the distance to the nearest point of the N. coast being 400 miles. It appears again on the S. coast of New Guinea, near Torres Straits, and extends along the N.E. coast of Australia, the Great Barrier Reefs being on its outer edge.

The Arru islands and New Guinea are thus united to the continent of Australia; and it is rather a singular coincidence that the kangaroo, an animal which was long supposed to be peculiar to Australia, is found both on the Arru islands and on the southern part of New Guinea; and as no specimens have been met with on the northern coasts of the latter island by Forrest and the French navigators who have been there, it seems to exist only on the portion included by the Great Australian Bank.

New Guinea.—The northern part of this island, that is to say the portion lying to the N. and N. W. of the range of mountains already alluded to, partakes of the rugged and broken character of the volcanic islands of the Indian Archipelago, but the south-western part is low and undulating, and we my conclude that it bears a considerable resemblance to the northern coasts of Australia, since the several Dutch navigators who explored the Gulf of Carpentaria, and who were in the habit of coasting this part of New Guinea on their way to Australia, considered them as being portions of the same continent, and they were thus delineated in our maps until Cook passed through Torres Strait and decided tha question as to their insularity. A very interesting account of the S. W. coast of New Guinea is given in Modera's " Narrative of the Voyage of the Dutch Corvette ' Triton' in the year 1828." when this coast was explored with a view to forming a settlement; and as it contains information which bears upon this point I would willingly make some extracts, were they not of too great length to be inserted in a paper of so general a nature as this must necessarily be.

The Arru Islands.—This group of islands is situated on the northern verge of the Great Australian Bank, and extends from N. to S. about 100 miles; but as the eastern side of the group has not been explored, its limits in that direction are uncertain. Some of the southern islands are of considerable extent, but those to the N., lying close to the edge of the bank, are rarely more than 5 or 6 miles in circumference. The land is low, being only a few feet above the level of the sea, except in spots where patches of rock rise to the height of about 20 feet, but the lofty trees which cover the face of the country give it the appearance of being much more elevated. Coral reefs extend from the shores of all the islands, and in the eastern parts of the group these are often of great extent. The islands are divided from each other by narrow channels, some of which are of great depth, and in one of these there is said to be a whirlpool of so formidable a description that the natives will not venture to approach it even in their larger vessels. I regret that during my recent visit to these islands my time was so much occupied by inquiries connected with the expedition to which I was attached, that I could not ascertain this fact from personal observation. Upon the whole, it is evident that this group has not been left quite untouched by the convulsion which has shaken its neighbours, a circumstance that might naturally be expected from its position on the very edge of the bank, and in the close vicinity of the volcanic chain, the Great Ki Island being only 60 miles distant.

When is it taken into consideration that the primary mountain ranges both in south-eastern Asia and in Australia pursue a precisely similar direction, and that the westermost Asiatic range, if continued, would strike about the N. W. Cape where the western Australian range commences, while banks extending from both these continents actually approach to within 450 miles of each other, the question naturally arises as to whether these continents were ever united. This inquiry, however, would lead to details of too extensive a nature to be admissible in a paper of this description, and which would belong rather to geology than geography, but it is well deserving of being followed up, since it possesses an interest beyond that which attaches to geographical matters generally; for if it is found that the mountain ranges of Australia are a continuation of those of eastern Asia, we may expect that they will also afford the mineral wealth for which the latter are so celebrated. Our colonies in Australia are now in a condition which would render the discovery of valuable minerals of the very highest importance. The amount of agricultural produce raised in these colonies is considerably above that required for the consumption of the inhabitants, who are now anxiously looking about the world for a market for their surplus produce, and such a market would be afforded by a population employed in mining operations. We may reasonably expect that mineral wealth is not confined to the district of South Australia. The great range extending the entire length of the N.E. coast is of a very promising description, as is also the range which abuts on the N. coast near the new settlement at Port Essington, and which, if it preserves the same direction which is observed in the other Australian ranges, may be connected with that of South Australia. The Liverpool, Adelaide, and Alligator rivers, the largest yet discovered in Australia, appear to have their sources in this range.

In conclusion, I will venture to suggest that the great banks alluded to in this part might be introduced into our maps of the Indian Archipelago with very good effect, and if delineated by means of the dotted lines, as in the accompanying outline map, would rather improve their appearance than otherwise, while at the same time they would tend to illustrate to a certain degree the geological character of these countries. We have ample data from which to define their limits, except at the single point to which I have alluded in this paper, with regard to the S.W. extremity of Celebes.

The above is reprinted from the "Transactions of the Royal Geographical Society" of London for the year 1845 (vol. xv. p. 358). The paper was submitted to the Society by the writer soon after his return to England from this part of the world in April 1845, and was intended as the first of a series of essays, suggesting points of geographical enquiry necessary to complete a system that would classify the productive character of the principal islands of the Indian Archipelago;—but circumstances rendered it advisable that the series should be discontinued. Up to that period the narratives of travellers in the Indian Archipelago, although replete with valuable information, were generally deficient in those details necessary to complete a geographical system that would meet the requirements of the day;—indeed the extent and direction of the volcanic band which traverses the Archipelago, although studded with European settlements, was still undetermined; the active volcanoes supposed to exist near the northwest extreme of Borneo, and on Cap Island in Torres Strait, not having yet been erased from the maps by authority. But during the seven years that have since elapsed, geographical research has progressed with such rapidity in this part of the world, that the general outline of its physical structure has been completed, although much remains to be done in the way of filling up the details. The surveying expeditions directed by the English government to those points where researches could be prosecuted without exciting the jealousy of other nations, have determined the character of Palawan, Northwestern Borneo, the eastern part of New Guinea and of the Louisiade group;—while the scientific enquiries set on foot by the Netherlands Government with the view of developing the resources of its Eastern possessions, have greatly enlarged our knowledge of the southern portion of the Archipelago. And, lastly, the Journal for which this essay is intended has been the means of bringing together a mass of practical information illustrating the geography of South Eastern Asia and the Indian Archipelago, as creditable to the collector as to the community which has supported his undertaking. In Australia, also, the progress of discovery has been so rapid and effectual, as to excite a feeling allied to astonishment in those who have been accustomed to trace the slow but steady advance of the early explorers. This new impulse, which will soon leave nothing more to be done in the way of Australian inland discovery, was commenced by a traveller who possessed in an eminent degree that combination of courage and caution necessary to conduct a small party through regions occupied by wild tribes; together with a sound practical knowledge of all those branches of science to which the attention of travellers in unexplored countries should be directed. Alas! that I should have to speak in the past tense of a traveller whose career had scarcely been commenced, and whose generous devotion to the cause led him to undertake a journey calculated to decide at once all the remaining points necessary to complete a system of Australian geography. But the most sanguine have ceased to hope that even Leichhardt's dauntless spirit can have withstood the privations entailed by a protracted wandering in the wilderness.

But before entering again on the subject of physical geography, I find it necessary to state explicitly that the possibility of a connection having once existed between Asia and Australia, which I had advanced as the great incentive to further enquiry, was disputed at the general meeting of the Geographical Society before which it was read, by one of the leading members, whose high reputation as a proficient in the science of geology entitled his opinion to great weight. This opposition was founded on the conclusions arrived at by the celebrated comparative anatomist, Professor Owen, from an examination of remains of extinct Australian mammals, and which had been developed at the meeting of the British Association of the previous year. These conclusions had been adopted by some of the leading geologists, as will be seen by the following extract from the Presidential Address delivered at the Anniversary Meeting of the Royal Geographical Society which took place about the time:

> I cannot make this allusion to the British Association without inviting geographers not only to repair to the ensuing meeting at Cambridge, but to endeavour there to propound for discussion, in the Subsection of that great national institution, which is specially allotted to them, more suggestions than they have been accustomed to make in former years. Even those geographers who have no such communications to offer, may rest assured that they will reap much instruction from the assembled geologists, zoologists, botanists, and ethnologists. I might indeed simply refer you to the last volume of the Transactions of the British Association, containing the admirable report of Professor Owen on the extinct mammals of Australia, and to the beautiful generalizations with which it is terminated; and you will instantly see, from evidence offered by his own science, that this great comparative anatomist takes the broadest and soundest views of the connexion between the ancient and modern distribution of masses of land. Showing us that, as a whole, the extinct quadrupeds of our island are closely analogous to those of the continents of Europe and Asia, and that these quarters of the globe are separated by no natural boundaries which could have caused great variation in the distribution of animal life. Professor Own infers that England must have been a portion of the Continent, when it was tenanted with the same species of now extinct elephants, rhinoceroses, hippopotami, bisons, hyænas, tigers, bears, &c., inhabitants of the common Continent. Even Africa is, on one of its flanks, so slighty divided from the rest of the old world of the geographer, that its existing races of mammals in some sort intermingle; though certain quadrupeds, as the giraffe and hippopotamus, which have become extinct in Europe and Asia, still exist in Africa. But when we cast our eyes to Australia on the one hand, or to South America on the other, then is the fauna as entirely dissimilar in each, as we should expect to find it in countries partitioned off by such wide seas and great natural barriers. From observing the fact, that the fossil mammalian remains of these two continents are as unlike those of Europe, Asia, and Africa, as their present quadrupeds, Professor Owen rightly concludes "that the same forms were restricted to the same provinces at a former geological period, as they are at the present day;" and thus he sustains the views of modern geologists, that in those periods immediately anterior to our own, the great geographical features of the earth must have been the same as those which now prevail.—*Address to the Anniversary Meeting of the Royal Geographical Society*, 26*th May*, 1845, *by Roderick Impey Murchison, V.P.R.S. & G.S., &c. &c., President.* p. 75.

An examination of specimens of Australian fossil *Flora* brought to England by Count Strzelecki in 1844, and which had been submitted to Mr J. Morris for comparison, presented very different results, as appeared in the following extract from his report:

"In instituting a comparison between the species collected from the Australian deposits, and those described from the Burdwan coal-field by Professor Royle, we observe both the remarkable analogy of form of some species, and the actual identity of others; from which we may probably be led to infer that the deposition of the strata containing them was not only contemporaneous, but that the conditions of the flora of some portions of the Indian and Australian continents, at that epoch, were not very dissimilar."—*Strzelecki's Physical Description of New South Wales* p. 253.

This fact could have been brought forward at the time, as Count Strzelecki's work was then published;—but as the writer's object was merely to promote enquiry, he naturally hesitated in opening a controversy which could have answered no useful purpose, and from which it is by no means probable that he would have come off with advantage. The recent discovery of fossils of well known "Silurian" species in the mountain ranges of New South Wales, has further established the fact that Australia is not an outcast from the family of continents, notwithstanding Blumenbach's famous theory. It is true that the fossil remains of mammals discovered in the limestone caverns of the Wellington range and the Kanobolus are all of the marsupial character, but this merely proves that if mammals of the forms now existing in Europe and Asia ever inhabited Australia previous to their introduction by man (which is by no means probable) they deposited their bones elsewhere.

But to return to the subject under review. The great desideratum of 1845 was a more perfect knowledge respecting the arrangement and distribution of those tracts of land which shewed distinct proof of disturbance by Volcanic action, yet retained in some degree the characteristics of primary formations. I had an opportunity of inspecting the eastern extremity of one of these tracts in 1832, when on the south coast of Java. It is thus described in Dr Horsfield's "Mineralogical Sketch of the Island of Java" which is inserted in the general map of that island by Sir Stamford Raffles, in his "History of Java." "Extensive district of secondary volcanoes mixt with hills of Limestone, especially near the sea, where the Limestone rocks are piled up to great heights—basis Basalt, and Wackem Breccia in the beds of rivers;—also Porphyry, Jasper, Cornelian, Agate, Obsidian. In some places Quartz appearing in Rock-crystals Prasem or Amethyst, rarely siliceous petrefaction." It was not until 1838 that I had an opportunity of inspecting one of the larger and less dependant areas of this formation, on the occasion of a journey across Moa, one of the islands lying immediately to the east of Timor, which appeared to consist of a mass of land, upheaved to its present elevation without any further disturbance of the strata, than was just sufficient to show that the remains of marine animals of forms corresponding with those still existing in the neighbouring waters, which are scattered pretty plentifully over the island, owed their presence rather to the upheaval of the land, than to the retreat of the waters which must once have covered a portion of its surface. But it is on the neighbouring island of Timor, where the line of subterranean action has crossed primary ranges, that the evidences of this simple upheaval is most striking and distinct. There masses of land of purely primarary formation, with the animal and vegetable kingdoms closely corresponding with those of the neighbouring continent of Australia, are found lying on tracts sprinkled with corals and marine shells, some hundreds (indeed I may safely say, thousands) of feet above the present level of the ocean. That these tracts owe their elevation to upheaval, may be inferred from the circumstance of the process being still active, a fact that can be ascertained without much investigation at the principal European ports, Dilli and Copang;—in the former by comparing the present elevation of the reef of coral which forms the harbour, with the accounts given in the old Directories, and in the latter by inspecting the madreporic cliff on the brow of which part of the town is erected.

These "Areas of Upheaval" as I have been induced to name them, include at least as large a portion of territory in the Indian Archipelago as that occupied by the active Volcanic Bands, in which nearly all traces of former character is lost in the chaos that has been produced by the intensity of the volcanic heat. The leading characteristics of the "Areas of Upheaval" consist in the general distribution of limestone formations, often in the form of the "mountain limestone" of England;—in the presence of protruded minerals in those spots where the line of upheaval has crossed primary ranges, and the subterranean heat has been sufficiently great to project the metals;—and in the prevalence of upraised coal beds where the subterranean force has been so slight as to be exhibited only in upheaval, without great disturbance of the strata.

II. PRIMARY RANGES.

GEOGRAPHICAL DISTRIBUTION.—*Malayan, Cambodian and Anam Ranges.—Ranges of Borneo and Celebes.—Continuation towards Australia.—Traces of primary ranges in Sumatra and the Philippines.—Recent explorations in Australia.—Connection between the Monobar Range of North Australia and the great Eastern Coast Range traced by Leichhardt.—Explorations of Sturt and Mitchell.—General altitude of mountains and table-lands.—* PRODUCTIVE CHARACTER. *Metalliferous deposits.—Character of the surface soil.—Natural vegetation.—Australian timber.—Marine productions.*

With a view to simplicity of arrangement, I include under this term all formations antecedent to the recent volcanic epoch, adopting as a test the presence of primitive granite *in situ*. During the last few years, much additional information has been obtained respecting the ranges of South-eastern Asia. The Malayan Range, the limits of which are pretty accurately defined by the coast lines of the Peninsula, remains as before with regard to direction, but many important and interesting details concerning its geographical structure will be found in the pages of this journal. The intercourse recently opened from this port with Cambodia, has produced some valuable information respecting the range which runs along the western coast of the Indo-Chinese Peninsula, dividing the ancient kingdoms of Cambodia and Laos from that of Siam.* This range ceases as a continued chain at Kampōt in Lat. 11° S., but is continued by isolated hills and ranges to the south extreme of the Peninsula. No addition has been made to our knowledge of the Anam or Cochin-Chinese range, beyond a confirmation of the fact that it runs parallel to the east coast of the Peninsula throughout its length.

In my essay of 1845, I have continued the Cambodian Range from the northwest extreme of Borneo to Gunong Ratos, near Banjar Massin, an error into which I was led from it being the only primary range on the south coast of Borneo with whose existence I was then acquainted.† More recent data shew that this range, after traversing the western part of Borneo, terminates on the south coast, a little to the eastward of Kota-ringin. The Gunong Ratos would therefore appear to have been formerly connected with the primary range which shews at Bintulu, on the northwest coast of Borneo, and which may be a continuation of one of the Indo-Chinese ranges. The Anam or Cochin-Chinese Range is that which can be traced most distinctly across the Archipelago to Australia at the present day. The interval between Cochin-China and Borneo will appear great, unless we consider the reefs and shoals which extend across this part of the China Sea, to be submerged links of the chain. When once across this submerged area, the primary ranges of Cape Kaneungan and the southern limbs of Celebes continue with little interruption to a point only 240 miles distant from the outer verge of the Australian Bank of Soundings, and no great stretch of the imagination is required to carry it on to the upheaved remains of primary formations in Timor, and thence to the Arnhem Peninsula in Australia.

---

* *See* Journal of the Indian Archipelago vol. v. p. 306.

† I must have fallen into this error from information received during my visit to Borneo in 1834, as I find these ranges thus alluded to in a paper on the Geography of Borneo which I drew up at the request of the late Sir Alexander Johnston in 1837, and which is published in the Transactions of the Royal Asiatic Society for that year:

"One of the Eastern Asiatic ranges, after extending along the S.W. coast of Sumatra, terminates at its S.E. point. Another runs along the Malay Peninsula, is lost for a time, but appears again in the high peak of Lingin, and terminates in Banca and Billiton; and a branch from this separates at Pulo Timoan, on the east coast of the Peninsula, and ends at Carimata, in the strait between Billiton and Borneo. Two ranges traverse Cambodia and Cochin-China in the same direction, and these will be found to extend to, and, perhaps, to traverse Borneo. Between the Cambodian range and the mountains at Sarawak, on the north-west extremity of Borneo, the Natunas islands and Pulo Condor form the connecting link; and as the Sarawak hills run to the south-east, the range is probably continued, either by a connected line, or by isolated mounts, until it terminates in the Gunung Ratos, near Cape Selatan."

The Sumatran chain must be dismissed from the list of primary ranges; for although it evidently has been of this formation, and was probably connected with the continent of Asia by a line passing through the Nicobars and Andamans, yet the strata have been so disturbed by the volcanic band which extends along the western coast, that no portion of the old formation has been detected *in situ*. An area of upheaval seems to extend along the centre of the island from one extremity to the other, but the great breadth of the alluvial plains which form the eastern coast, from Diamond Point to the Strait of Sunda, has hitherto prevented a close inspection except in two or three spots. If the laws which regulate the deposition of the substances from which coal is formed, and the upheaval of the beds into positions available for the use of man, are the same here as in Australia, the inland parts of Sumatra opposite this settlement are likely to contain coal-beds at least as extensive as those of New South Wales, but the width of the alluvial plains lying at the base of the area of upheaval will render them more difficult to discover, as the cliffs in which the coal crops out on the east coast of Australia rise abruptly from the sea shore, and the beds can be detected from boats passing close along the land.

In the Philippine Islands, Mindanao, the Gilolo Group, and in the western peninsula of New Guinea, distinct traces of the former existence of primary formations are shewn by the presence of those descriptions of minerals which are less liable to destruction by intense volcanic action; but as far as my experience goes, no particle of this formation in its primitive state has been detected throughout the groups which form the eastern barrier of the Archipelago.

In Australia the most important modern discovery connected with physical geography, was made by Dr Leichhardt during his memorable overland journey from Moreton Bay to Port Essington in 1845, during which he established the connection between the Monobar Range which abuts on the north coast near the Cobourg Peninsula, and the great eastern coast range, from which it appears to branch off about the parallel of the tropic. Leichhardt only traced the range across the Arnhem Peninsula, and along the southwestern side of the Gulf of Carpentaria, a distance of about 600 miles, but its continuation in the same direction can scarcely be considered problematical, as at the furthest point reached by Sir Thomas Mitchell in the following year (about Lat. 24° Long. 145°) the country dipped to the southward towards the stony desert discovered by Captain Sturt during the previous year (1845) near the northern boundary of the South Australian colony. In my former essay, I anticipated that the

Monobar Range would be continued to the neighbourhood of Spencer Gulf, but if a branch had extended in this direction, Captain Sturt must have met with it during his late perilous journey in the interior. The direction taken by the South Australian Ranges is still undetermined, although it can scarcely be considered doubtful. This, the only remaining point necessary to complete our acquaintance with the general physical structure of Australia, would have been decided had Dr Leichhardt survived to complete his last journey. At present, the honor of being the first to trace the course of this central range appears likely to fall upon the enterprising colonists of South Australia, who have already pushed their explorations from the west side of Spencer Gulf along the range to the northwest, and the result is calculated to encourage them in the further prosecution of their enterprize.

The primary ranges rarely attain a very great elevation, about 6,000 feet being the highest point. In this particular they are far inferior to the volcanic and upheaved ranges, but this deficiency is amply compensated by their excessive width, indeed each range seems to consist of a number of small parallel ranges overlying primary bases sometimes as much as 300 miles, and rarely less than 100 miles, in breadth. The higher points are generally massive and rounded,* although peaked mounts are not uncommon, especially in the neighbourhood of the volcanic bands. The only known table-lands of large extent are those of Laos or Upper Cambodia, and the plains discovered by Sir Thomas Mitchell in 1846 near the northern boundary of New South Wales. The latter are 2,000 feet above the level of the sea.

Productive Character.—The primary ranges in Southeastern Asia and the Indian Archipelago are all more or less metalliferous, but the labour of working under ground, and extracting the metals from the matrix, is so unsuited to the habits of the natives, that mining operations are only carried on in those countries which are subjected to despotic governments. Lead mines are worked in that part of the Malayan Range which traverses the kingdom of Ava; and copper mines have been opened in the Anam or Cochin-Chinese range, the produce of which is equal in quality to South American copper, but inferior to that of Japan. The produce of these mines has been imported into Singapore, that of Anam in considerable quantities, but the cessation of commercial intercourse has put a stop to the importation. Iron is also smelted from the native ores on the western side of the Anam range, and it is said that silver mines are also worked, but I cannot vouch for the correctness of the report. Elsewhere in this region, mining operations are confined to the collection of metals that have been projected from the original site by subterranean heat, which can be traced distinctly to recent volcanic action. The tin of the Malay Peninsula, Banka, and Billiton, and the gold of the Peninsula, Borneo and Celebes, are all collected from the detritus in which the projected metal has been deposited. Lead and antimony ore are found in the Cambodian Range to the north of Kampot, but no mines have been opened.

---

* The sketch of Lumpo Batang in vol. v. of this Journal p. 617 affords a fair specimen of the primary elevations.

In Australia, the southern portions only of the primary ranges have been attentively examined, but as far as the search has been extended, it would go to prove that the primary formations of this continent are equally metalliferous with those of Southeastern Asia. Copper ores have been found at Port Curtis, near the southern extremity of the range which extends along the northeast coast, and as long ago as 1802, Flinders met with indications of copper at Good's Island in Torres Strait; but his suggestion does not seem to have been followed up by the naturalists attached to subsequent expeditions. "The stone is granitic and brittle; but there is also porphyry, and in one place I found streaks of verdegrease, as if the cliffs above had contained copper ore." *(Flinders' Voyage to Terra Australis,* vol. II. p. 120.) Lead and copper mines have been worked in South Australia for some years past, and others have been opened recently in the western coast range, a little to the north of Swan River. The massive range which extends from Cape Lieuwin to Cape Naturalist does not appear to have yet been explored, but from a cursory examination of its southern extremity during a residence in the neighbourhood in 1831, I was led to suspect that this southwestern peninsula might some day become the Cornwall of Australia. Hematitic and specular iron ore, and copper pyrites, have been found on the northwest coast near Admiralty Gulf, which may be considered sufficient to establish the metalliferous character of the northern part of the Central Ranges.

The productive character of the surface soil of this formation, which consists chiefly of decomposed sandstone and crystalline rock, is inferior to that of both the other areas, indeed it is only in the great river basins, which are favourably situated for irrigation, that agricultural produce is raised in sufficient quantities to allow a surplus for exportation. But on the other hand the superior quality of the forest timber which overspreads this area is daily becoming more appreciated, and probably many valuable gums and guttas still remain to be discovered. In Australia, the prevailing vegetation differs materially in its character from that of south-eastern Asia, the forms now existing throughout the interior of Australia being identical with those discovered in the coal beds of New South Wales, and, it would seem, in those of Upper India also. The process by which the existing forms of

Indian vegetation have been introduced, may be traced in the following extract from a little work describing the Cobourg Peninsula and Port Essington, which was published by the writer when last in England:

> "Throughout the Cobourg Peninsula, generally near the sea-shore, are found patches of land varying in extent from two or three acres to fifty acres and upwards, on which the vegetation is perfectly in character with that of the islands of the Indian Archipelago. These spots are covered with a thick jungle, difficult to penetrate, and the trees are often of an enormous size. Among these I have recognized the *waringin*, or banyan-tree of Indian Islands; the *kanari*, (a tree producing a nut which yields a kind of sweet-oil, and under the shade of which the nutmeg-trees are planted at Banda,) together with many others common to the Spice Islands. The shrubs, and even the birds that inhabit these patches, are also in character with those of the Indian Islands; the kangaroo, which seeks shelter here from its enemy, the native dog, being almost the only peculiarly Australian animal that is found in them, and these obtain their food in the open grounds.
>
> * * * *
>
> "The plants obtained from the countries of the Archipelago that are of the primary formation, invariably flourished better than those from the volcanic islands; the productions of Singapore and of the Malayan Peninsula adapting themselves at once to their new quarters. This is accounted for by the circumstance of the soil, and even the rocks and stones of the northern coasts of Australia being precisely similar in their character to those of the countries in the south-eastern parts of Asia. Even the general direction taken by the hill-ranges is the same in both countries, and were it not that they are separated by a narrow but unfathomable gorge, studded with volcanic islands, they might be considered as forming portions of the same region. The indigenous productions of the soil certainly differ considerably in their character, but a process is at present going on in Australia which, in the course of time, if left untouched, would produce a similarity upon this point. Innumerable patches of oriental vegetation, many of them thousands of acres in extent, are spreading inland from the northern and eastern coasts, even in spots far beyond the tropic, eating up, as it were, the Australian vegetation, which disappears before them as the marsupials disappear before the animals of Europe. Every inch of ground gained is made good. The dense foliage, impervious to the sun's rays, spreads out above, sheltering the mass of dank vegetation that accumulates on the surface of the ground, which is thus left to rot and form new soil."—*Enterprise in Tropical Australia* pp. 76 and 106.

The leading feature of an Australian landscape consists in the open nature of the forest, which proves highly favourable to pastoral pursuits. Owing to the comparative poverty of the soil, the growth of the forest trees is slow, producing that durability in the timber for which the English oak is so esteemed, but in a much greater degree, the wood of several of the prevailing forms of the Eucalyptus being apparently indestructible except by fire, and then it burns with slowness, throwing out a heat scarcely inferior to that produced from coal: indeed the common gum wood, burning in the galley range of a frigate, when the flame ceases, can scarcely be distinguished from a glowing sea-coal fire. Stumps of trees cut down in the neighbourhood of Sydney in 1788 were still standing in 1847 without any other appearance of decay than the destruction of the bark, and will probably, if undisturbed, continue in the same state for a century to come. But the chief value of this timber consists in several varieties being obnoxious to the *teredo* or worm which perforates and destroys submerged timber, and proves so destructive to ship's bottoms and wooden piles, especially in these tropical regions. The piles that were driven in 1838 to form the jetty at Port Essington, were perfectly sound when the settlement was abandoned ten years afterwards, while foreign timber that was allowed to remain in the water alongside the pier only for a few days, was invariably attacked by the teredo.

Up to a very recent period the submerged banks which extend from Asia and Australia (coloured green in the map) furnished the principal articles of commerce supplied by the primary region. Agar-agar, a marine lichen extensively used in China, trepang or sea-slug, and mother-o-pearl shell, are common to both banks, but the Australian bank is by far the most productive, probably from its not having yet been so extensively worked as the Asiatic bank.

III. VOLCANIC BANDS.

*Limits and direction of the Volcanic Bands.—Necessity for a combined series of observations on volcanic activity.—Intensity of subterranean heat in the volcanic areas.—Corresponding subsidence of the adjacent surface.—*PRODUCTIVE CHARACTER.—*Paucity of valuable natural productions.—Agricultural produce of the Philippines, Moluccas, Sunda Chain, and Sumatra.*

The limits of the volcanic band which crosses the Archipelago are so distinctly defined by the active volcanoes with which it is studded, that no difficulty is experienced in tracing its course. The few facts that our limited knowledge of the laws which regulate volcanic currents have enabled me to collect, lead to the inference that the volcanic stream originally commenced in the neighbourhood of Kamtschatka from which it takes a southwest direction through the Kurile Islands, Japan, and Loo Choo, skirting the Coast of Asia, to Formosa, where it abruptly turns to the south and southwest through the Philippines and Mindanao to the Moluccas, embracing the eastern extreme of Celebes and the western peninsula of New Guinea, and then curves to the westward along the Trans-Javan Chain to the Strait of Sunda, when it assumes a northwesterly direction through Sumatra and the Andamans to Cheduba island, in the northern part of the Bay of Bengal. It is not without a certain degree of hesitation that I have continued the band from the western extreme of New Guinea along the north coast of that island to New Britain, although its volcanic character has been decided by recent French navigators, for there remains a tract including thirteen degrees of longitude in which no active volcano has been seen. Indeed it is by no means improbable that the band which takes a southerly direction from Japan through Fatzima, the Bonin and Mariana Islands, may prove to be continued to New Ireland; in which case the chain of active volcanoes which extends through the Solomon Islands and the New Hebrides to New Zealand, and perhaps further to the south, may indicate the course of an independent stream.

It is to be regretted that no series of observations has yet been made on the periods of volcanic activity in different parts of the bands, as a mere daily record kept at the European settlements which are scattered along them, from Kamtschatka to New Zealand, and from the Moluccas to Bengal, during only a single year, would furnish data from which important points could be decided, that can now be only matters of conjecture. Indeed there can be no objection to such a simple and inexpensive series of observations being carried out throughout the world. The lines of volcanic action which have all but separated Europe and Asia from Africa, and the northern from the southern continent of America, have evidently been ruled by the same law with that which has effected the separation of eastern Asia from Australia; and the question must soon be boldly entertained whether the circulation of volcanic electricity is not as necessary to maintain the productive character of the globe, as that of the blood to preserve vital existence in the human body. But it is in the Indian Archipelago, where the process by which volcanic regions have been formed is still actively progressing, and where the smooth seas afford easy access to all the chief points of interest, that the greatest facilities are afforded for prosecuting the researches necessary to establish the basis of a system.

In these regions, so great has been the intensity of the subterranean heat, that where the volcanic bands have crossed or passed along ranges of the primary formation, scarcely a vestige of their former character remains, the primitive rocks being metamorphosed, and even the metals they contained melted up and dissipated, with the single exception of the most indestructible of all metallic substances, gold; the presence of which in minute grains, deposited in the beds of mountain streams, being, as far as I have been able to discover, the only evidence that now remains to point out the former existence of primary ranges.

The process by which the volcanic formations have been thrown up, and by which large tracts of land in which the subterranean action has not broken through the surface have been raised to their present level, seems invariably to have been attended by a corresponding subsidence of the surface in their immediate neighbourhood;—indeed the facts brought forward by Mr Darwin in his essay on the "Structure and Distribution of Coral Reefs" go to prove that this subsidence still continues in those parts which are not affected by active subterranean force. The banks of soundings which extend from Asia and Australia present features which must class them as "Areas of Subsidence"; with the exception of certain spots which have been penetrated by lines of upheaval, and where the *fringing* reefs distinctly point out the character of the rocks and islets. Beyond the limits of these "Banks of Soundings" the sea is everywhere unfathomable a mile or two from the shore, indeed in many spots, no soundings can be obtained with an ordinary deep-sea lead line from the brow of the limestone cliffs which often bound the shores of areas of upheaval. Even where the banks of soundings have been penetrated by areas of upheaval the depth of water is greater than elsewhere; and the shores, instead of sloping gradually into the sea, fall at once to depths corresponding with those of the bank generally. This is particularly apparent on the north-west coast of Borneo, in the neighbourhood of Bawian and Salombo, and on the Western side of the Gulf of Carpentaria.

Productions.—The productive character of the volcanic area is totally distinct from that of the primary formations. With the exception of gold, which is found scattered in minute particles in the beds of the mountain streams, no single production of the primary areas repays the labour of collection. This deficiency is amply compensated by the surpassing richness of the soil produced from the volcanic rock, which decomposes rapidly before the influence to the atmosphere. The *natural* productions are unimportant, the nutmeg, which is scattered over that portion of the band which approaches the continent of Australia, being almost the sole exception. But the docility of the native inhabitants proved to be such that they were easily coerced to labour, and the curved volcanic band which traverses the Archipelago became studded with European settlements throughout its length and breadth, which now yield the great bulk of the produce exported from the Indian Archipelago. In the northern part of the Philippines, the famed Manila tobacco is the chief production; sugar plantations, which supply the Australian colonies, occupy the centre;—and the *musa textilis* which yields the Manila Hemp is the chief product of the south. Spices are almost the sole production of the Dutch settlements of the Moluccas, inferior articles being neglected, as is the case in countries which produce gold. Some of the islands east of Java are still independent of European controul, and these yield productions suited to the wants of the natives to such an extent as to give rise to an export trade with all parts of the Archipelago. In Java, coffee, sugar, rice, and tobacco, are the most important articles, the two first being exported to Holland in immense quantities. Coffee and pepper are the chief products of Sumatra, where the soil is less fertile than in some of the other islands of the band. The volcanic agency here becomes comparatively weak, and is confined to the outer coast of the island; where, being backed by an area of upheaval, the greater portion of the alluvium descends into the sea and is lost. I have not sufficient data to enable me to define the area of upheaval which intervenes between the volcanic band and the north-eastern coast from the neighbourhood of Palembang northward, but its existence is distinctly shewn in the detritus brought down by the rivers. It is probably owing to this circumstance that the alluvial plains of Sumatra which abut on the Great Asiatic Bank are less fertile than those of Java, where the alluvium almost exclusively consists of decomposed volcanic rock.

IV. AREAS OF UPHEAVAL.

GENERAL CHARACTER.—*Borneo-Philippine Areas:—Mindoro, Palawan and the Sulu Group.—Moluccan Area: Xulla Isles, Buru, Ceram, and Amboyna.—Timorian Area: Keh Islands, Timor Laut, Serwatty Islands, Timor, and Sumba, or Sandalwood Island.—The Arru Group.—Central Range of New Guinea.—Arnhem Peninsula.—New South Wales and Van Diemen's Land.—Areas of the second class: the Tenasserim and Sumatran chains of Islands.—Javan Areas.—South Point of Bali and Banditti Island.—North coasts of Flores and Sumbawa.*—PRODUCTIVE CHARACTER.—*Soil—Agricultural produce.—Textile materials.—Mineral products:—Coal and Metals.—Metallic deposits of Timor: Copper, Gold, and Quicksilver.—Edible Bird's Nests.*

Under this head are included all those masses of land which furnish evidence of having been raised to their present level by subterranean action, but in which the volcanic heat has either never found vent in the surface, or has subsided at periods anterior to the present epoch. These areas may be subdivided into two classes;—the first consisting of spurs extending from the western side of the volcanic band which bounds the Archipelago to the eastward; the other consisting of masses of upheaved land lying parallel and adjacent to the volcanic band. The first subdivision displays crystalline, igneous and aqueous rocks, upraised occasionally to immense elevations, with every degree of disturbance, from mere dislocation of the strata, to a state of chaos scarcely inferior to that of the volcanic areas. In fact these spurs furnish intrinsic evidence of having once been traversed by volcanic streams whose activity has ceased, probably at the period in which the stream finally succeeded in breaking across the primary ranges at a point where they offered least resistance. The prevalence of limestone formations, often exhibiting fossil remains of still existing species of marine animals, is the leading feature both of the larger and smaller areas, indeed the latter only differ from the others in being immediately dependent on the volcanic band.

Commencing to the north, the first area of upheaval can be traced from the neighbourhood of Manila in the Philippines through Mindoro, Palawan, and along the northwestern part of Borneo, where the subterranean force has penetrated and piled up the primary ranges, but appears to have been stopped by the westernmost range, which, although disturbed, has not been broken through. The absence of any other visible cause, leads me to attribute the extraordinary projection of metal into the surface soil at the western base of the range, to the agency of this once active volcanic stream, but it is only recently that I have been able thus to account for the phenomena I met with when inspecting the gold mines of Montradok in 1834.* This rule will be found equally applicable to the gold deposits of the Malayan Peninsula, Sumatra, Celebes, Timor, and New South Wales, the deposits being only found on the side of the range opposite to that against which the volcanic force has been directed.

A second area extends from Mindanao through the Sulu chain to the northeast extreme of Borneo, but its further progress cannot be traced until we are better acquainted with the geography of the interior of that island. A third line extends from the north-east extreme of Celebes, where the Klobat Mountain is still an active volcano, through the northern peninsula of that island; and small areas of upheaval, with a corresponding subsidence of the adjacent surface, can be traced through the Little Paternosters, Pulo Laut, and Salombo, to Bawian. The subterranean force which has elevated Madura, and the chain of islands extending from it to the eastward, may have come from the north, but as the volcanic band passes in the immediate neighbourhood, it will not be safe to include these islands in an independent area of upheaval, until geological investigations shall have shewn their character to correspond with that of other parts of the area.

The eastern peninsula of Celebes, the Xulla Isles, Buru, Ceram and Mysol, all belong to this system, and I should be inclined to trace the line of upheaval from the neighbourhood of New Guinea, but some confusion exists hereabouts which cannot be cleared up without further enquiries. In all the recent physical maps that I have had access to, an active volcano is laid down as existing in the north-west part of Amboyna. As no mention is made by Valentyn or other old writers of an active volcano in this neighbourhood, I was not very minute in my enquiries when there in 1842, being satisfied that the southern peninsula possessed, in an eminent degree, all the characteristics of upheaval without great disturbance of the surface;—the limestome formations, especially, being apparently in the same relative position as when first formed.

But as this volcano must have been placed there on authority, I am not inclined to pronounce against its existence, especially as the range in the eastern part of Celebes is deflected to the south, or at right angles to the course of simple upheaval in that vicinity. In this case a volcanic band must be introduced as passing south from Gillolo through Ceram and Amboyna to the isolated volcano distant 180 miles to the S. S. W. of the latter island. Should this prove to be the fact, a volcanic band will either have crossed an area of upheaval or must have thrown out lines of upheaval simultaneously to the right and left, phenomena which do not appear in other parts of the Archipelago.

The fourth area of upheaval extends from the southern part of the western peninsula of New Guinea through the Keh Islands, Timor Laut, the Serwatty Islands, and Timor, to Sumba, or Sandalwood Island. A recent volcanic band skirts the north-western part of this area rather closely, Serua, Nila, and Damma having been active volcanoes since the arrival of Europeans in the Archipelago, but they are now either extinct, or very rarely in a state of activity. In my essay of 1845 I have pronounced the peaked mountain at the north-east extreme of Timor to be in a state of activity, having been induced to do so by the reports of natives of the adjacent island Kissa, and from my having on two several occasions seen the summit of the mountain in a state of ignition, but I have since been informed by gentlemen connected with the Portuguese settlements in Timor, that there are no active volcanoes in the eastern part of the island. I must therefore have been deceived by the burnings of the jungle which the natives make towards the close of the year, for the purpose of clearing new lands for cultivation.

---

* "The Eastern Seas &c." p. 281 *et seq.*

The eastern islands of the Arru Group have been upheaved to the height of from 80 to 150 feet, a fact I was not made acquainted with until recently, although I had detected evidences of disturbance when visiting the halfdrowned western islands of the group. As the animal and vegetable kingdoms still correspond very closely with those of Australia, these islands afford a clue to the former condition of the area now occupied by the great Australian Bank. So long ago as 1837 the writer endeavoured to draw attention to the Arru Group in a paper detailing the few important facts that were known concerning it, which was read at a meeting of the Geographical Society; but with the exception of a flying visit to the western part by Commodore D'Urville in 1839, when on his way from Port Essington to Torres Strait, and an equally hasty exploration we made in H. M. S. Britomart in 1842, nothing has been done towards extending our geographical knowledge of this group. The Dutch scientific expedition of 1827, which has contributed so much towards dissipating the cloud of mystery that hangs over these eastern islands, passed near the group on more than one occasion without calling; but it is to be hoped that the spirit of enquiry which is now predominant in Netherlands India, will not allow this small but interesting portion of its territory to remain a *terra incognita.*

The area next in rotation is that which extends along the centre of the great or eastern Peninsula of New Guinea, at least I have been induced to class this great mountaion range as an area of upheaval. The western part of the range, which terminates at Cape Buro on the S. W. coast, has been known for nearly three centuries, and is named in the old Dutch Charts "Sneeuw Bergen" or the Snowy Mountains, owing to the upper portion of the range, as seen from the coast, appearing from its dazzling whiteness, especially when the sun is near the horizon, to be covered with perpetual snow. The altitude of this part of the range, as estimated by the officers of the Dutch corvette "Triton" in 1828, is only exceeded in this part of the world by that of the Himalaya. The eastern part of the range has lately been seen by Captains Blackwood and Stanley, and was found to consist of very high land, but scarcely attaining half the elevation assigned to the western portion. Captain Stanley did not survive to reach England, or he would probably have furnished some interesting details respecting this region. From the published narrative of his voyage, it would appear that the S.E. extreme of New Guinea, beyond the parallel of 9· S., is of primary formation. The central mass of mountain land has evidently been the result of upheaval, but whether the volcanic force is still active can only be decided when the range comes to be closely examined. I have therefore coloured this part yellow, as indicating simple upheaval.

Traces of upheaval are shewn on the western coast of the Gulf of Carpentaria, by the notes of Captain Flinders in his "Voyage to Terra Australis", and by the description of the specimens given by Dr Fitton in his essay on the geology of Australia which is appended to Captain King's Narrative;—and evidence of the same nature was detected by Dr Leichhardt in the interior of the Arnhem Peninsula, when crossing the line of action indicated by the direction of the ranges in the Northwestern horn of the Gulf of Carpentaria. Mountain limestone is alone wanting to complete the resemblance of this area to that which extends from the south part of the western Peninsula of New Guinea, named above the "Timorian Area." The essay of Dr Fitton above alluded to, was read before the Geological Society of London in 1825. It is entitled "An Account of some Geological Specimens &c." but it is, in fact, a collection of all the geological data connected with Australia then extant, arranged and commented upon in a manner so eminently suggestive of points of enquiry, that the name of the author must be recorded as "Father" of the science of Physical Geography in Australia. Dr Fitton's attention was particularly directed to the striking uniformity of arrangement that had been observed by Captain Flinders in the hill-ranges and chains of islands forming the northwest horn of the Gulf of Carpentaria, and their parallelism to the great range of Timor is distinctly noticed. Nor did he fail to call attention to the singular flat-topped hills which present so striking a feature on the northern coasts of Australia, and which had not yet been examined about the upper parts. Two of the most remarkable of these hills are situated on the Cobourg Peninsula, and were repeatedly examined by parties attached to the garrison of Port Essington. Dr Fitton's anticipation of their importance as illustrative of physical geography, proved to be well founded; but as a description is not necessary to elucidate the particular subject now under review, I prefer making the "Flat-topped Hills" the subject of a separate essay.

The sixth and last area of the first class is found in the South-eastern part of Australia and in the eastern part of Van Diemen's Land. This area has been examined by one of the most practised observers of the day, the Count P. De Strzelecki, during a course of exploration extending ever a period of five years, commencing in 1839, and the leading features of these important districts will be found fully described in his "Physical Description of New South Wales and Van Diemens Land."[*]

The areas of the second class invariably extend in a direction corresponding with that of the part of the volcanic band on which they depend. Commencing to the north, the chain of islands which runs along the coast of Tenasserim, from Martaban to the neighbourhood of Penang, is an area of upheaval; and the contiguous coast affords evidence of having been subjected to the same influence. The southernmost point in which upheaved limestone has been detected, is at Pulo Bidan, a few miles to the north of Pinang, but it would appear from the projection of the metals in a liquid state, that the whole of the Malayan Range, including Linga and Banka, have been affected by volcanic action. The chain of islands which extends along the west coast of Sumatra is of a similar character to the Tenasserim chain. These islands have been geologically described by Dr Jack, who inspected the group at the instance of Sir Stamford Raffles when governor of Bencoolen (Geol. Transactions, 2nd series, vol. 1.) The two areas of upheaval in Java are distinctly defined in Dr Horsfield's Geological map. Their connection with the volcanic band cannot be doubted. The southeastern extreme of Java, the south point of Bali, and Banditti Island in the Straits of Lombok, are all upheaved table lands, bounded by precipitous limestone cliffs, several hundred feet in elevation. Areas of simple upheaval are found on the *north* side of the volcanic band at Flat island, Rusa Radji and Lingit, and at the Iron Cape of Flores.

---

[*] *London*, 1845.—From a report of the proceedings of the Geological Society in the London Athenæum of February the 21st of this year, I perceive that two distinguished Geologists have brought their rival claims to the honor of having anticipated the discovery of Gold in Australia, before that Society. A mere cursory perusal of Count Strzelecki's publication will be sufficient to shew, that by proving the physical features of the Sydney mountain range to be identical with those of the Russian Ural, the great gold field of the day, he pronounced in language that could not be mistaken by the merest smatterer in Geology, the auriferous nature of its deposits. That he did not distinctly say "search and you will find" will be sufficiently understood and appreciated by those who are aware that such an announcement, although it might have had the effect of making him the idol of the Stock Exchange, was calculated to render valueless the pastoral property of those hospitable settlers who had received him with open arms throughout the southern colonies. Indeed the precious metal had already been discovered by an old shepherd of the Wellington district, (named MacGregor, if I remember right) who had long been in the habit of carrying with him specimens of gold embeded in quartz, on his annual visits to Sydney with his flock of fat wethers. He did not disclose the locality in which he found them, but it was evident that he must have picked them up somewhere on his sheep-walk. In fact the Count must have repeatedly been made aware of the anxiety of the stock holders, who feared that MacGregor's discovery might lead the shepherds to neglect the flocks while searching for the precious metal. This man was as assuredly the discoverer of Australian Gold in the matrix, as was Mr Hargreaves of the metaliferous deposits; but by far the greater merit is due to the latter, as his discovery was not the result of accident, but of deductions drawn from comparison with the Geological features of the auriferous regions in California.

But the most painful feature connected with the rival claims of the English Geologists, consists in the naturalist who first brought forward the scientific data on which anticipations could be founded being a foreigner, whose admiration of and confidence in the British character, led him to publish the result of his researches in London, under the auspices of one of the rival claimants for the honor of the discovery.

While on this subject, I cannot refrain from allusion to a practice that has recently come to be adopted by travellers;—that of submitting their rough journals to professional *amanurnses* or book-makers to be worked up for publication. These gentlemen are sometimes in the habit of engrafting the observations of previous travellers, who from death or absence may not be in a position to claim their property, on those of their principal, without acknowledgment, or even the slightest allusion that might lead to references; thinking thereby to enhance the reputation of the work they are employed to polish. This principle, or rather want of principle, has been particularly displayed in some recent narratives of travellers in the Indian Archipelago. Sooner or later these literary piracies must be detected, and when some Bancroft or Cooley of the next century employs his talents in separating the grain from the chaff, honorable names will have to bear the odium which should properly attach to those of unknown booksellers hacks.

PRODUCTIVE CHARACTER.—The excessive fertility of soil which characterises the narrow band in which the volcanic stream is still active, does not extend to the areas in which the circulation has ceased. Nevertheless the fertilizing qualities of decomposed limestone have aided in forming a soil better adapted for the growth of produce necessary for the sustenance of man than the rich, fat, soils of the volcanic bands. Maize, upland rice, yams, and other esculent roots here attain perfection, and the nourishing qualities of the produce are apparent in the superior vigour of inhabitants of areas of upheaval. The wheat grown in the uplands of Timor is remarkably rich in *gluten*, although the small size of the grain gives it an unfavourable appearance in European eyes. The cultivation of produce adapted for commerce is still in its infancy, owing to the lands of this formation having hitherto been neglected in favour of volcanic tracts, but its prospects are by no means disheartening. The coffee, cotton, cacao, and hemp (*musa textilis*), grown on the upheaved areas, are the best produced in the Archipelago; although the soil is not calculated to produce sugar, or spice equal to that of the Volcanic band. The mineral wealth of these areas is, however, more calculated to attract European enterprise. Coal has been found whenever it has been sought for with diligence in spots favourable for its deposit:—iron ore of excellent quality is abundant where the line of upheaval has crossed primary ranges;—and limestone, so necessary as a flux in smelting the metal, is found everywhere, so that the larger areas prossess those elements that have mainly contributed to the prosperity of Great Britain. Fortunately, the gold deposits in the western parts of the Archipelago are now pretty well exhausted, and in the more remote regions, Timor, and possibly Sumba, are the only spots in which the steady course of industry is likely to be interrupted by the search for precious metals. The native chiefs of the former island, terrified by the rapacity of the early European navigators, are said to have combined in establishing a law which made searching for gold a capital crime, except on occasions in which it was thought proper to propitiate the deities by the dedication of a *Bulan Mas* or golden moon, when a human being was sacrificed to the spirit of the mines before the gold could be collected. This ceremony is probably alluded to in the "Account of Timor", published in Mr Moor's "Notices of the Indian Archipelago. *Appendix p.* 6."

The name of the author is not given, and after diligent enquiry, I have been unable to trace his identity; but from the tenor of his remarks I suspect that he must have resided some time at Coupang, and collected his information concerning the more remote islands from parties employed in the commerce of its dependencies;—otherwise he could not have described Sumba as a low island, not much higher than Madura. Nevertheless I can affirm the general correctness of his observations, as I had Mr Moor's book with me when I first visited Timor in 1839; and repeated visits during the five following years enabled me to make enquiries upon nearly every point he has brought forward. Mr Hazaart, who appears to have been the Resident of Coupang at the period of his sojourn, was so strongly impressed with a belief in the metalliferous wealth of the southern part of the island, that he would scarcely converse on any other subject, and his incessant appeals to the government led to a commission of enquiry, headed by M. Macklot, an eminent mineralogist, being sent to Timor. An overland journey was made with a large party to Filarang, where abundance of copper was found, but the strata had been so broken up, that mining operations could not have been prosecuted with advantage (*see* Journal I. A. vol. IV p. 495.) The reputed gold deposits, which lie on the south side of the island, were not examined. Quicksilver in a pure state is sometimes brought to Coupang by natives from the interior, and as the collection from the hollows of the rocks in which it is deposited does not entail heavy labour, it might become an article of commerce were its value known.

The Edible Nest which is constructed by the Hirundo Esculenta in the caverns of the limestone cliffs, is found throughout the areas of simple upheaval, but not elswhere; so that this singular production, which from its value is well known to those engaged in the commence of the Archipelago, furnishes one of the best tests for deciding the character of the regions in which it is found.

V. GENERAL CONCLUSIONS.

Marsupial Character of Fossil Remains of Mammals in Australia.—Distribution of existing Forms throughout the Archipelago.—Asiatic Forms in Java, Borneo, and Sumatra.—Distribution of Marsupials in New Guinea, Ceram, Timor and Celebes.—Extent of Asiatic and Australian Groups.—Test of the comparative antiquity of Areas of Upheaval.—Volcanic Bands.—Epoch of disconnection.

In venturing to draw conclusions from the facts presented by a study of the Physical Geography of the Eastern Islands, I do not presume to trench upon that prescriptive right to generalize on the notes of travellers, which has for some years past been conceded to leaders of Geological Science, but rather to note those suggestions which naturally arise from extensive voyaging through a region whose physical character is yet undetermined. Until the general outlines, at least, have been ascertained, science must still be indebted to those travellers who have had opportunities of acquiring practical information, for that preliminary arrangement which men of science may extend to a system. That a connection once existed between Asia and Australia, is, I think, established by the simple facts brought forward by Mr Morris in Count Strzelecki's work; indeed those who asserted contrary opinions in 1845 were (innocently, I am sure) supporting the famous spontaneous-developement theory of the "Vestiges of Creation", which was exciting the indignation of the scientific world at the time. The opposition my suggestions then met with is not likely to be renewed, for the leading geologist of the day will scarcely repudiate a region that he has admitted into his own "Silurian" beds; and the Professor of comparative anatomy will probably reconsider the conclusions he ventured to draw from the facts presented by one of the minor branches of a science yet in its infancy.

Nevertheless, the facts established by Professor Owen in his essay on the Fossil Mammals of Australia, will prove of eminent importance in deciding the epoch at which the separation of the continents took place, for although the Professor's zeal leads him sometimes to give too much prominence to the science which he has made his own, no one can doubt the correctness of the practical results he has arrived at. The fact that no remains of mammals of more perfect forms than the marsupials were found among the numerous fossil specimens from Australia that were submitted to his examination, shews that the disconnection must have taken place during an epoch in which the marsupial was the only existing form of mammals in Australia and probably in Southern Asia also.

An enquiry into the distribution of the *existing* forms of mammals throughout the Indian Archipelago will throw some light on this interesting point. Commencing with the species common in Asia at the present day, and excluding those which may have been introduced in a domesticated state, such as the horse, dog, kine, and deer, the common Brown Monkey has penetrated farthest from the continent of Asia, as it extends through Sumatra and the Trans-Javan chain to the eastern extremity of Timor; but the thirty miles of strait which separates this island from Letti seem to have stopped its further progress, for it is not found in a wild state in the Serwatty Group. To the north it extends through Borneo and Celebes, and is found in a single island of the Moluccan seas, Batchian. This animal, from its habit of frequenting the banks of rivers, is very liable to be carried out to sea in the masses of drift which are sometimes detached from the banks by the current, and its extensive distribution may be attributed to this cause. But such accidents are not likely to happen to the more bulky pachyderms, nor are the frail vessels of the natives calculated to transport them from island to island, so that an enquiry into the distribution of these monster mammals will best answer our purpose. In Borneo the Elephant cöexists with the Black Bear, *(ursus malayanus);* the *Felis macroscelis,* or Sumatran Gigantic Tiger Cat, and so many varieties of the quadrumanes that their introduction can scarcely have been accidental. In Java the Rhinoceros, the Royal Tiger, the Wild Ox of the Malayan Peninsula, and several varieties of the smaller quadrumanes, still exist in the jungles. Sumatra and the Peninsula contain every form of mammal found in Java and Borneo, with the addition of the *Tapir.* These facts would go to prove that Java, Borneo, and Sumatra continued attached to the continent of Asia, at a comparatively recent epoch. The common brown monkey is the only member of the family of quadrumanes that has reached Celebes and Bali, although the strait which separates the latter island from Java is only two miles wide.

We will now trace the range of the *marsupialia* from Australia towards the continent of Asia. A variety of the Kangaroo *(macropus),* two varieties of the Opossum *(didelphis),* one of which closely resembles the Ring-Tailed Opossum of New South Wales *(Phalangista Cookii),* one variety of the *Dasyurus,* the Native Cat of the colonists of New South Wales and Port Essington; and one variety of the small Flying Opossum, have been found in the southwest part of New Guinea; and singularly enough the Kangaroo has adapted himself to the half-drowned nature of the country by inhabiting the trees. A variety of the Kangaroo still exists on the Arru Islands, which seems to be identical with the small Grey or "Brush" Kangaroo, found in the thickets throughout Australia. This is the "Filander" of Valentyn. The name by which it is known in the Moluccas is "Pilandok." In Ceram, the Ring-tailed Opossum, the Native Cat, the Flying Opossum, and the little Flying Squirrel, all marsupials, and identical in appearance and habits with those which extend throughout Australia, hold undisputed possession of the forest trees. The

Ring-tailed Opossum, which is the most numerous, as in New South Wales, is a common pet throughout the Moluccas.* The Malayan name is "kusu" which has been latinized by the old Dutch naturalists into "Cuscus", and I am sorry to see that this barbarism has been adopted by modern Zoologists. In Timor the Ring-tailed Opossum is common in the southern parts of the island. The only marsupial that has yet been traced in Celebes is the Flying Opossum, but the zoology of this island still remains to be explored. The zoological connection of Java, Sumatra, and Borneo, with the continent of Asia, is as distinct as that of Timor, Ceram, and New Guinea, with the continent of Australia. Probably Celebes will be added to the Australian group, but until its zoological character is more fully ascertained, it will be safer to allow it to remain neutral ground. The inferences to be drawn from these facts must be self evident.

Those who are acquainted with the process which is still going on in the volcanic bands of our immediate neighbourhood, will be unwilling to entertain the opinion that the subterranean action which has influenced tracts so remote from each other, can have been exerted simultaneously. The only test that I have been able to discover which is likely to prove applicable to the determination of the comparative antiquity of the epochs of upheaval, is that which must be familiar to those who have had "transactions" in gold dust in this part of the world. Proficients in the art of ascertaining the "touch" of specimens of native gold, by the colour that it leaves when rubbed upon a smooth black pebble, assert that the comparative value of gold is determined by its *age*, which I suppose means the comparative antiquity of the period in which it has been deposited in the alluvium. This test appears rather fanciful, but it is certain that experienced "touch-adars" can detect in a moment the difference between Pahang and Bornean gold.

---

* The opossum, more especially the Ring-tailed variety which inhabits trees, is the most hardy of Marsupials, that is to say its geographical range is farther extended than that of any other pouched animal. The tree opossum and the native cat (Dasyurus macrourus?) are the only varieties of this ancient form of mammals that have not retreated before the European quadrupeds that have been introduced into the southern districts of Australia; the mere presence of a flock of sheep, without their usual attendant, the dog, being sufficient to drive the Kangaroos from the "runs." The tree opossums are not liable to be disturbed by any animal less agile than the monkey, as they are never seen on the ground except when thrown out of the trees while fighting, and then they scramble up again as fast as they can. The consequence is that the tree opossums now abound in the settled districts of Australia to an extent that could not have happened previous to the arrival of Europeans, when the aborigines kept down their numbers by dragging them out of their nests in the hollows of trees to serve as food. Even the presence of the monkey is not fatal to the tree-opossum, as is evident from their coexisting in Timor and in parts of South America. The Musang or Mungoose of the western parts of Archipelago, will prove fatal both to the tree-opossum and to the Native cat, whenever he comes to be introduced to Australia, as he can enter the hollows of the trees and destroy them in their nests. The tree opossums of Australia feed on the leaves and tender shoots of the Eucalyptus. In the Moluccas, where the Eucalyptus is rare, if found at all, the tree opossums feed on the leaves of the Waringin and Lingoa trees, and on the outer bark of the Kanari. As the two first exist in the Malay Peninsula, the latter under the name of *Angsannah*, the absence of the tree-opossum from this part of the Archipelago cannot be attributed to want of suitable food. An examination of the limestone caverns in the northern part of the Malay Peninsula, with a view to the discovery of fossil remains of mammals, might be attended with very interesting results, for although the rock has been of sub-aqueous formation, as evidenced by the existence of fossil shells, still the remains of mammals may be found there, as well as in the caverns of the same formation in Australia. Such an examination is not necessary to shew that marsupials once existed on the continent of Asia, that point having been decided by their appearance in the secondary beds of Europe; still it would be a matter of great interest to science were their remains discovered in the southern parts of Asia.

But this is a point of no immediate interest to physical geography, although, if followed up by an assayist, it might be productive of useful results in determining the course and progress of former volcanic currents. It is by no means improbable that recent researches in electricity, which have been pursued with such vigour for some years past, may have developed laws which regulate the volcanic currents, although the fact is yet unknown in these remote regions. It is evident that the volcanic band has shewn a determined obstinacy in breaking across the primary ranges, and a tendency to run along the outermost range when it had succeeded. I have already alluded to a volcanic band which extends south from Japan through the Bonin and Mariana or Ladrone Islands. In the absence of any evidence to the contrary, I have long inclined to the opinion, that this band, prolonged through the Carolines to New Ireland and the New Hebrides, was the first line of attack; and that spurs extending from the Solomon Group to the neighbourhood of Moreton Bay; and from the New Hebrides through Norfolk and Howe's Islands to the coast near Sydney, produced the upheaval of the south-eastern part of that continent, and broke through Bass Strait:—that a branch from this line precipitated itself directly on the coast of New Guinea, the minor currents which extend to the northwest extreme of the Gulf of Carpentaria, and along the Timorean area, being continuations:—and that a second branch broke off from the Ladrones through Egoi, Yap, and the Pellew Islands to Celebes; but an examination of the islands lying between the Ladrones and New Guinea, with the express object of tracing the course of the volcanic band, will be necessary before conclusions can be arrived at. From this point, however, I can proceed with a tangible foundation. The distinct character of the mammalian forms existing in the countries lying on the Great Asiatic Bank, shew that Borneo, Java, and Sumatra, were attached to the continent of Asia by unsubmerged ranges at a period long subsequent to the separation of Australia; which would imply that the curved band that passes from Formosa through the Philippines, the Moluccas, Java, and Sumatra, is the most recent line of volcanic action.

VI. INFLUENCE OF GEOLOGICAL CHARACTER ON THE PROGRESS OF EUROPEAN COLONIZATION.

*Early settlement —Occupation of the Philippines by Spain.—The Dutch in Java and the Moluccas.—The English on the west coast of Sumatra.—The national character unadapted for cultivating tropical plantations with forced labour.—Cultivation of spices in the Straits Settlements by means of imported Free Labour.—Its probable influence on the progress of settlement.—*CLIMATOLOGY. *Influence of climate on European enterprise.—Climate of Primary Regions.—The Malay Peninsula.—Australia.—Salubrity of Dr Leichhardt's party.—Fevers on the north coast: their probable cause—Unsuccessful settlement of North Australia.—Climate of areas of upheaval.—Timor.—Dr Little's theory of coral reefs as a cause of fever.—Extension of Dutch settlement on the volcanic bands.*

The highly productive character of the volcanic regions of the Archipelago is strikingly illustrated by the fact, that during the three first centuries of European occupation, the agricultural settlements were formed exclusively on islands traversed by the volcanic band;—the small establishments kept up at Malacca, Macassar, and on Timor, having been maintained solely for the purpose of coercing the maritime trade. The early enterprises of the Portuguese were not of a nature calculated to result in permanent occupation. The first successful "plantation" was established in 1565 by the Spaniards in the Philippines, where a happy mixture of force and priestly influence brought the natives into a condition which rendered their labour available, and the plantations have gradually extended through the volcanic islands of the group to Mindanao, where they are progressing as rapidly as the intolerant spirit of Islamism will permit in its eastern stronghold. The Dutch commenced the same career about half a century later in Java and the Moluccas, but force only was employed in training the natives, except at Amboyna, where as orderly, well-conducted, and perhaps as well-informed a community as will be found in the more secluded parts of Europe, shews how great a blessing the Dutch rule might have proved had native improvement met with equal encouragement elsewhere. As it is, were the influence of the Netherlands power to cease at this moment, scarcely a trace of their stewardship would be discernible at the commencement of the next century, except in Amboyna and the neighbouring groups, where the conversion of entire communities not only to the precepts, but also to the practices of christianity, will leave indelible traces of some better principle having been introduced than that of sordid gain.

The English East India Company entered the field rather late in the day, on the west coast of Sumatra. Their success was never very brilliant, and when the course of European policy led to the transfer of their Sumatran settlements to the Netherlands Government, they were resigned without a sigh. Indeed our nation is not well calculated either to form or maintain tropical agricultural settlements, at least on the principles that have hitherto obtained. The spirit that leads our countrymen to attack a Canadian or Australian forest, axe in hand, revolts at the system vulgarly called "nigger driving" which has been found necessary to successful agriculture among the Polynesians of Java and the Philippines, as well as with the negroes of Brazil and the southern states of North America. The eminent success that has attended British colonial enterprise in those regions where Anglo-Saxon perseverance can be brought to bear directly on the clearing and cultivation of new lands, and the *want* of success that ever met our attempts to carry on the cultivation of those tropical plantations in the East and West which were obtained by conquest, (for England has rarely attempted, and never succeeded, in initiating a purely agricultural settlement within the tropics) are equally attributable to that spirit which prompts the emigrant to prefer winning his way by the strength of his own right hand, to urging weaker races to labour that he may reap the fruit.

A sort of compromise has been effected in this settlement by employing self-imported free labour in cultivating the soil; and those enterprising planters who have been actively employed for years past in converting the jungle of our island into spice gardens, probably never contemplated that they were initiating a system which is calculated sooner or later to produce an entire change in the face of nature throughout the "Further East." It must be familiar knowledge that the Indian Archipelago is now much more appreciated in Europe than was the case twenty, or even ten years ago, when it was almost a terra incognita, except to those whose commercial transactions led them to take an interest in its affairs. The fact of a few of its thousand islands affording the principal means of support to two European monarchies, is alone calculated to draw attention to those territories which are still unoccupied. That the British will take the lead in the advance that must happen some time or other, may be inferred from the circumstance of their being the only nation possessing territory in this part of the world capable of managing the people of China, whose countless myriads present the most available sources of labour.

I will close this essay with a few remarks on "Climatology" a branch of the science of Physical Geography intimately connected with the subject of colonization, whether European or Asiatic. The superior salubrity of countries of the primary formation is evidenced by the absence of endemic disease throughout those regions of Southeastern Asia and Australia, which partake exclusively of the primary character;—a fact which those who have long resided in the Straits Settlements, as well as those who have sought and found health during a temporary sojourn, will have no difficulty in affirming, as far as this neighbourhood is concerned. This peculiarity, for such it is in countries situated under the Equator, is in a great degree attributable to the nature of the soil, which rapidly absorbs the moisture, and is free from those deleterious particles which render the smell of the newly turned up ground in volcanic regions sickening, and almost nauseous. Here, however, the fragrance that accompanies the breaking up of new lands, is scarcely inferior to that which invigorates the husbandman in Europe, and renders cultivation the most healthful occupation that can be pursued.

The influence which this comparative salubrity exerts on the character of European enterprise in this settlement, is sufficiently apparent. We see little of that anxiety to snatch a hasty harvest, which is so prominently displayed in those tropical regions where the nature of the climate renders a protracted residence irksome, and even dangerous to Europeans. That the comparative advantage we enjoy in this important particular, coupled with the favourable nature of our geographical position, will sooner or later make Singapore the Constantinople of the Far East, can scarcely be doubted. As a general rule, the inland parts of primary regions, as far as known, possess a healthful climate, in fact the mode of life adopted by the Jakuns of the Malay Peninsula, and by the native tribes of Australia, could not be pursued with impunity in countries subject to febrile influences. Mr Gray, who crossed the Peninsula from Malacca to Pahang, and Mr J. R. Logan, who has more recently explored the uplands of Johore, suffered only from fatigue while traversing the jungles: and Dr Leichhardt crossed the Australian continent from south to north without being detained for a single day by the illness of a member of his party, except on one occasion in which some of his companions had been desperately wounded by the natives. It was not until he reached Port Essington that he discovered for the first time that malaria existed in Australia, and he expresses no small amount of surprise thereat in the Lectures he delivered soon after his return to Sydney :—

> "I will here mention that the sea-breeze at Victoria is extremely weak, and I think that Captain Macarthur is right in attributing partly to this fact, the fever, from which the garrison has several times severely suffered. It is extremely difficult to assign any other reason for the want of salubrity. The country is undulating and hilly ; the soil is sandy, and absorbs rapidly the heaviest showers; the forest is open, the mangrove thickets which cover the mouth of the creeks scarcely deserve the name of swamps, as they are washed by the tide, and form no accumulation of vegetable matter which might produce the miasma or malaria which generally renders tropical countries so dangerous After rain the air is fresh and pure, the ground dry, and a walk most agreeable. Those localities, which are freely exposed to the sea-breeze, as for instance Croker's Island, are, according to Captain Macarthur, very healthy."—*Lectures delivered by Dr Ludwig Leichhardt, at the Sydney School of Arts, the* 18*th and* 25*th days of August*, 1846. *p.* 13.

The facts alluded to by Dr Leichhardt caused much anxiety to those interested in the settlement, and the writer was at one time rather actively employed in searching out the cause of an insalubrity which is not known elsewhere in Australia, by examining those spots in the neighbouring seas which were remarkable for their unhealthiness. The result will be found in the following extract. I must apologise for so often quoting from my own literary productions, but the peculiar nature of the enquiry, which was not calculated to prove attractive to travellers who happened not to be personally interested, affords me no other source of reference.

"In taking under review the circumstances of the various settlements in these seas, it would appear that the most salubrious spots are those situated upon narrow straits. The banks of navigable rivers, above the reach of the salt-water, hold the next rank. Open bays are by no means to be recommended; but land-locked harbours appear to be perfect repositories for all that can be injurious to the constitution.

The repeated failures that have attended the efforts of Europeans to form settlements in this part of the world afford support to the above view of the case. A secure harbour has always been a point of the first consideration, and although this can often be obtained in a strait, which at the same time would prove most convenient for merchant-shipping, still the superior facilities for defence presented by a harbour with a single entrance has proved too attractive to be overlooked. The English East India Company have twice attempted to establish themselves upon the Andaman Islands, in the Bay of Bengal, at Port Cornwallis, and at Port Chatham; but the settlements were in both cases abandoned in consequence of the unhealthiness of the climate. More recently, the Dutch made a similar effort with the like result at Triton Bay, on the south-west coast of New Guinea, another land-locked harbour. It is singular that in the last instance the settlement was about to be formed upon a narrow strait, near a spot which had been selected by the natives as the site for their principal village; but the intention was abandoned, chiefly on account of the strength of the tides. Indeed the natives of these countries appear to form the best selections of spots adapted for occupation, although, as far as I could discover, even the more intelligent of the Indian islanders had established no fixed rules, but were rather guided in their choice by instinct than by conclusions drawn from a course of reasoning. All the principal European settlements in the Archipelago were originally native towns, with the exception of Batavia, the capital of Java. This spot was selected on account of its being a favourable position for a fortress, and at a convenient distance from the native capital, which was situated some miles inland."—*Enterprise in Tropical Australia. p.* 94.

The removal of the settlement to the outer part of the harbour of Port Essington was more than once contemplated, and would have been carried out had not the authorities been in constant expectation of the receipt of orders to break up the establishment, from the first year of its existence;—in fact the interest in the settlement had subsided with the retirement of the minister under whose auspices it had been founded. Had the slightest encouragement or even approval been afforded by the cotton manufacturers of Manchester and Glasgow, they would not now have been solely dependent on foreigners for their supplies of the raw material; at least the results of the experiments in tropical agriculture carried on at Port Essington authorise this conclusion. A little agitation in the manufacturing districts would probably have been responded to, but support to colonial enterprise should be spontaneous, otherwise it may fail when most needed. I have entered into this subject rather more fully than I had intended, as Port Essington was the first European settlement founded on primary formations within the tropics for purely agricultural purposes, and it will probably be the last; at least until the Anglo-Australians have had time to spread to the north coast, when the textile produce, whether wool or cotton, will probably be required for their own manufactories in the south.

If we may judge from the robust appearance of the mountaineers of Timor, Ceram, and Celebes, the climate of the higher regions of areas of upheaval is equal to that of the primary ranges. Indeed I should be inclined to give the preference to the uplands of Timor, where the character of the country and its vegetation is so open and Australian as to induce a belief that one is breathing the mountain air of one of the Australian ranges. The *coasts* of upheaved tracts possess, however, a very doubtful character, those of Timor, especially, being notoriously insalubrious. An interesting essay on "Coral reefs as a cause of fever," appeared in earlier numbers of this journal, and met with a considerable amount of opposition in various quarters. It is less difficult to demolish than to construct a theory, and such is the perversity of human nature that the destroyers sometimes obtain the greater credit. If the author will consent to review his theory, making it applicable only to *Fringing* Reefs, in which the process of upheaval is constantly presenting fresh surfaces of living coral to be destroyed by the atmosphere, and discarding *Atoll* or *Barrier* Reefs, which are the characteristics of areas of subsidence, he will furnish a highly valuable contribution to medical topography, without incurring the liability of being pestered by opposition, at least on the part of those who have had the advantage of practical experience.

It will scarcely be necessary to enter into particulars concerning the climatology of the volcanic region. The Netherlands government, by the recent acquisition of the Portuguese settlements on Solor and Flores, and by the establishment of what is intended to be a permanent settlement on the north side of the Great Eastern Peninsula of New Guinea, have now exclusive possession of all the countries of the Archipelago, south of the equator, which are traversed by volcanic bands. Some sixteen years ago I recorded expressions of regret that England had relinquished possession of the settlements in the Archipelago that had been captured during the last war. Subsequent experience, more especially a closer acquaintance with the character of the British emigrant as displayed in the southern colonies, has led me to qualify this opinion very materially. Each nation that has established itself in this part of the world is evidently pursuing the career for which it is best adapted. An Englishman would be as much out of his element in directing the forced labour of Java or the Philippines, as a Spanish *Corregidor* or a Dutch *Opziener* would be, if set to drive-in a herd of wild cattle from the "bush," or to fell an iron-barked *Eucalyptus* with a broad axe.

LEGEND OF THE BURMESE BUDHA, CALLED GAUDAMA.

By the Revd. P. Bigandet.

PREFACE.

In giving publicity to the following history or Legend of the last Budha known in Burmah under the name of Gaudama, the supposed originator, or perhaps the modifier of the great budhistic religious system, the writer has been induced by the sole motive of adding his humble mite to the literary treasures amassed by others on this interesting subject, and perhaps supplying some particulars which eventually may prove not quite useless to those who assume for themselves the difficult task of elucidating the general history of Budhism, by enabling them to fill up a few of the many gaps so frequently met with throughout that dreary tract. As this religious system has undergone considerable changes and modifications both in its dogmas and general discipline, at the hands of the various nations that have received it, during the lapse of many centuries, it is more than probable that legends purporting to give an account of the life and preachings of Budha have their *variantes* brought in by time and circumstances, and, above all, by the innate mobility of the human mind. Translations of the same Legend made with the manuscripts to be found among all budhistic nations, would undoubtedly throw a considerable light on many points hitherto wrapped in complete darkness. It is almost needless to add that the present publication has no claim whatever to scientific distinction. The translation was made nearly eleven years ago, in an obscure corner of the Tenasserim coast, under all possible disadvantages. The translator was deprived of every means of making researches and availing himself of the labour of others. He sat at the work with the sole object of perfecting himself in the knowledge of the Burmese language. Copious annotations have been added for the purpose of elucidating the text, which would otherwise prove unintelligible to those who have not devoted some time to the study of Budhism. The sources from which they have been derived are the perusal of the Burmese religious writings, and the knowledge acquired by a constant intercourse with the natives and particularly the Budhist monks.

Of the manuscript from which the present translation has been made little is to be said. It was brought from Ava, the seat of Budhist learning. The original text was in the Pali language, from which it has been translated into Burmese. It is not easy to pass a correct judgment on the merits of the Burmese translator, nor to ascertain his fidelity in adhering conscientiously to the original, without leaving aside any portion that might have appeared to him of minor interest. But if it be permitted to judge of the merits of this performance from other similar translations from Pali, we may conclude that the task has been done with a tolerable degree of accuracy. It must however be confessed that this Legend, such as it is, offers in many parts a wretched assemblage of various unconnected and discordant rhapsodies, jumbled together to make a whole, planned very likely by ambition and fanaticism, but certainly well calculated to suit the views and taste of the votaries of Budhism. Be that as it may, the reader, in going over the following pages, ought to be prepared, in imitation of the cock of the fable, to scratch over the dust and rubbish of this Budhistic composition, and perhaps, like it, he may have the good luck to find some precious pearls, that will repay him for his trouble.

CHAPTER 1ST.

I adore[1] Budha[2] who has gloriously emerged from the bottomless whirpool of endless existences; who has extinguished the burning fire of anger and other passions; opened and illuminated the fathomless abyss of dark ignorance, and who is the greatest and most excellent of all beings.

I adore the law which the most excellent Budha has published, which is infinitely high and incomparably profound, exceedingly acceptable and most earnestly wished for by Nats and men, capable to wipe off the stains of concupiscence and is immutable.

I adore the assembly of the perfect, of the pure and illustrious Ariahs[3] in their eight sublime states, who have overcome all the passions that torment other mortals, by eradicating the very root of concupiscence, and who are famous above all other beings.

I undertake to translate from the Pali[4] text the history of our most excellent Phra, from the period he left Joocita,[5] the fourth abode of Nats, to the time he entered into the state of Niban.

About four Thingies[6] and hundred thousands worlds ago,[7] the most excellent Budha, who is infinitely wise and far superior to the three orders of beings, the Brahmas, the Nats,[8] and men, received at the feet of the Phra Deinpakara the assurance that he would afterwards become himself a Phra. At this time he was a Ruthee[9] under the name of Thoumeda. During that immense space of time, he practised in the highest degree, the ten great virtues, the fire renouncings, and the three mighty works of perfection.[10] Having become a great prince under the name of Wethandra, he reached the acme of self-abnegation and renouncement to all the things of this world. After his death, he migrated to Joocita the fourth abode of Nats. During his sojourn in that happy place, enjoying the fulness of pleasure allotted to the fortunate inhabitants of those blissful places, a sudden and uncommon rumour, accompanied with an extraordinary commotion, proclaimed the gladdening tidings that a Phra was soon to make his appearance in this world.[*]

On hearing that a Phra was soon to make his appearance amongst men, all the Nats, peaceful inhabitants of the fortunate abode of Joocita, assembled in all haste and crowded around Phralaong,[12] eagerly inquiring from him, who was the fortunate Nat to whom was reserved the signal honor of obtaining the incomparable dignity of Phra. The reason which directed their steps towards our Phralaong, and suggested their enquiry, was that in him were already to be observed unmistakeable indices foreshadowing his future greatness.

No sooner had it become known that this incomparable destination was to be his happy lot, than Nats from all parts of the world resorted to the abode of Joocita to meet Phralaong and to congratulate him upon this happy occasion. Most glorious Nat, did they say to him, you have practised most perfectly the 10 great virtues[13]; the time is now come for you to obtain the sublime nature of Budha; during former existences you have most rigidly followed the observance of the greatest precepts and walked steadily in the path of the highest virtues; you sighed then after and longed for the happiness of Nats and Brahmas; but now you have most gloriously achieved the mightiest work, and reached the acme of perfection; it remains with you but to aspire at the full possession of the supreme intelligence which will enable you to open to all Brahmas, Nats and men, the way to the deliverance from those endless series of countless existences,[14] they are doomed to go through. You alone can free them from the vicissitudes and miseries essentially connected with the present state of all beings. The time is at last come, when you are to become Budha.

Unwilling to return instantly a positive answer, Phralaong modestly replied that he wanted some time to enquire particularly into the great circumstances always attending the coming of a Bhudha in this world, viz., 1st, the epoch or time a Budha appears; 2nd, the place he chooses for his apparition or manifestation; 3rd, the race or caste he is to be born from; 4th, the age and quality of her who is to be his mother. As regards the first circumstance, Phralaong observed that the apparition of a Budha could never take place during the previous period[15] of 100,000 years and above, that had just elapsed, because during that period the life of men was on the increase. The instructions on birth and death as well as on the miseries of life, which form the true characteristics of Budha's law, would not then be received with sufficient interest and attention. Should any attempt be made at that time to preach on these three great topics, men of those days to whom those great events would have appeared so distant, could not have been induced to look upon them with sufficient attention; the four great truths would have made no impression on their minds: vain and fruitless, would have been the efforts to disentangle them from the ties of passions then encompassing all beings, and make them sigh after deliverance from the miseries entailed upon mankind by birth, life and death. The period when human life was under a hundred years was not at all the proper period for such an important event, as the passions of men would then be so many and so deeply rooted, that in vain Budha would attempt to preach his law. As the characters a man traces over the smooth superficies of unruffled waters, instantly disappear, without leaving any mark behind, so the law and instructions that one would attempt to spread on the hardened hearts of men, would make no lasting impression upon them. Hence he concluded that the present period, when the life of men was of about 100 years duration, was the proper one for the apparition of a Budha. This first point having been disposed of, Phralaong examined in what part of the globe a Budha was to appear.

---

[*] *Remark of the Burmese translator.*—There are three solemn occasions on which this great rumour is noised abroad. The first, when the Nats, guardians of this world, knowing that 100,000 years hence the end of this world is to come, show themselves amongst men, with their heads hanging down, a sorrowful countenance and tears streaming down their faces, clad with a red dress, and proclaim aloud to all mortals the destruction of this planet, 100,000 years hence. They earnestly call upon men to devote themselves to the observance of the law, to the practise of virtue, the support of parents, and the respect due to virtuous personages. The second, when the same Nats proclaim to men that a 1,000 years hence, a Budha or Phra will appear amongst them; and the third solemn occasion, is when they come and announce to men that within 100 years, there will be in this world a mighty Prince[11] whose unlimited sway shall extend over the four great islands.

His regards glanced over the four great islands,[16] and the 2,000 small ones. He saw that the island of Dzapoudiba (the southern one) had always been the favorite place selected by all former Budhas: he fixed upon it, too, for himself. That island, however, is a most extensive one, measuring in length 300 youdzanas, in breadth 252, and in circumference 900. He knew that on that island, all former Budhas and Semi Budhas, the two great Rahandas[17] or disciples of the right and left, the prince whose sway is universal &c, all of them had invariably fixed upon and selected that island, and amidst the various countries on the island, that of Mitzima, the central one, where is to be found the district of Kapilawot. Thither, said he, shall I resort, and become a Budha. Having determined the place he was to select for his terrestrial seat, Phralaong examined the race or caste from which he was to be born. The caste of the people and that of merchants appeared too low and much wanting in respectability, and moreover no Budha had ever come out therefrom. That of the Pounhas was in former times, the most illustrious and respected, but that of Princes in those days was far surpassing it in power and consideration. He therefore fixed his choice upon the caste of Princes, as the most becoming his future high calling. I choose, said he, prince Thoadodana for my father. As to the princess who is to become my mother, she must be distinguished by a modest department and chaste manners, without having ever tasted any intoxicating drink. During the duration of 100,000 worlds, she must have lived in the practice of virtue, performing with a scrupulous exactitude all the practices and observances prescribed by the law. The great and glorious princess Maia is the only person in whom all these conditions are to be found. Moreover, the period of her life shall be at an end ten months and seven days hence[18]—she shall be my mother.

CHAPTER 2ND.

Having thus maturely pondered over these four circumstances, Phralaong turning to the Nats that surrounded him, anxiously expecting his answer, plainly and unreservedly told them that the time for his becoming Budha had arrived, and bade them to communicate forthwith this great news to all the Brahmas and Nats. He rose up and accompanied by all the Nats of Joocita, withdrew into the delightful garden of Naudawon. After a short sojourn in that place, he left the abode of Nats, descended into the seat of men, and incarnated in the womb of the glorious Maïa.

At that time, the inhabitants of Kapilawot were busily engaged in celebrating, in the midst of extraordinary rejoicings, the festival of the constellation of Ovtarathan (July—August). But the virtuous Maia, without mixing amidst the crowd of those devoted to amusements, during the seven days that preceded the full moon of July, spent her time among her attendants, in making offerings of flowers and perfumes. The day before the full moon, she rose up at an early hour, bathed in perfumed water, distributed to the needy four hundred thousand pieces of silver; attired with her richest dress, she took her meal, and religiously performed all the pious observances usual on such occasions. This being done, she entered into her private apartment, and lying on her couch, she fell asleep and had the following dream:

Four princes of Nats of the abode Isadoomaritz took the princess with her couch, carried it to the mount Himawonta,[19] and deposited it on an immense and magnificent rock, 60 youdzanas long, adorned with various colors, at the spot where a splendid tree, 7 youdzanas high, extends its green and rich foliage. The four queens, wives of the four princes of Isadoomaritz, approaching the couch where Maia was reclining, took her to the banks of the lake Anawadat, washed and purified her with the waters of the lake of all stains and impurities, and covered her with flowers brought from the abode of Nats. Near the lake is a beautiful mountain of a silvery appearance, the summit whereof is crowned with a magnificent and lofty palace. On the east of the palace, in the side of the mount, is a splendid cave. Within the cave a bed similar to that of the Nats was prepared. The princess was led to the place, and sat on the bed, enjoying a delicious and refreshing rest. Opposite this mount, and facing the cave where Maia sat surrounded by her attendants, rose another mount, where Phralaong, under the shape of a young white elephant, was roaming over its sides, in various directions. He was soon seen coming down the hill he was on, and, ascending that where the princess lay on her bed, he directed his course towards the cave. On the extremity of his trunk, lifted up like a beautiful string of flowers, he carried a white lily. His voice occasionally resounding through the air, could be heard distinctly by the inmates of the grotto, and indicated his approach. He soon entered the cave, turned three times round the couch whereupon sat the princess, then standing for a while, he came nearer, opened the right side of the princess, and appeared to conceal himself in her womb.

In the morning, having awoke from her sleep, the Princess related her dream to her husband. Prince Thoadodana sent without delay for sixty-four Pounhas.[20] On a ground lined with cow-dung, parched rice, flowers and other offerings were carefully deposited and profusely spread. An appropriate place was reserved for the Pounhas. Butter, milk and honey were served out to them in vases of gold and silver; moreover several suits of dress and five cows were offered them as presents, as well as many other articles. These preliminaries being arranged, the prince narrated to them the dream with a request for its explanation.

Prince, answered the Pounhas, banish from your mind all anxious thoughts, and be of a cheerful heart; the child whom the princess bears in her womb, is not a girl but a boy. He will after growing up, either live amongst men and then become a nighty ruler whose sway all the human race will acknowledge; or, withdrawing from the tumult of society, he will resort to some solitary place, and there embrace the profession of a Rahan. In that condition he will disentangle himself from the miseries attending existence, and at last obtain the high dignity of Budha. Such was the explanation of the dream. At the moment Phralaong entered into Maia's womb, a great commotion was felt throughout the four elements, and thirty-two wonders simultaneously appeared. A light of an incomparable brightness illuminated suddenly ten thousand worlds; the blind, desirous, as it were, to contemplate the glorious dignity of Phralaong, recovered their sight; the deaf perceived distinctly every sound; the dumb spoke with fluency; those whose bodies were bent, stood up in an erect position; the lame walked with ease and swiftness; prisoners saw their fetters unloosed, and found themselves restored to liberty: the fires of hell were extinguished; the ravenous cravings of the Preithas[21] were satiated; animals were exempt from all infirmities; all rational beings uttered but words of peace, and mutual benevolence; horses exhibited signs of an excessive joy; elephants with a solemn and deep voice expressed their contentment; musical instruments resounded of themselves with the most melodious harmony: gold and silver ornaments worn at the arms and feet, without coming in contact, emitted pleasant sounds; all places became suddenly filled with a resplendent light; refreshing breezes blew gently all over the earth; abundant rain poured from the skies during the hot season, and springs of cool water burst out in every place, carrying through prepared beds, their gently murmuring streams; birds of the air stood still, forgetting their usual flight: rivers suspended their course, seized with a mighty astonishment; sea water become fresh; the five sorts of lilies were to be seen in every direction; every descriptions of flowers burst open, displaying the richness of their brilliant colors; from the branches of all trees, and the bosom of the hardest rocks, flowers shot forth spreading all around the most glowing, dazzling, and varied hues: lilies seemingly rooted in the canopy of the skies, hung down scattering their embalmed fragrancy; showers of flowers poured from the firmament on the surface of the earth; the musical tunes of the Nats were heard by the rejoiced inhabitants of our globe; hundred thousands of worlds[22] suddenly approached each other, sometimes in the shape of an elegant nosegay, sometimes in that of a ball of flowers, or of a spheroid and regularly displayed peacock's tail; exquisite perfumes and the choicest essences embalmed the whole atmosphere that encompasses this world. Such are the wonders that took place at the time Phralaong entered his mother's womb.

When this great event happened, four chiefs of Nats from the seat of Isadoomaritz,[23] armed with swords, kept an uninterrupted watch round the palace, to avert any accident that might proved hurtful to the mother or her blessed fruit. From 10,000 worlds four Nats from the same seat, were actively engaged in driving away all Bilons[24] and other monsters and forcing them to flee and hide themselves at the extremity of the earth. Maia free from every disordered propensity, spent her time with her handmaids in the interior of her apartments. Her soul enjoyed in a perfect calm the sweetest joys; fatigue and weariness never affected her unimpaired health. In his mother's womb, Phralaong appeared like the white thread passed through purest precious stones; the womb itself resembled an elegant Dzedi.[25][*]

With the solicitous care and vigilant attention one carries about a Cabeit[26] full of oil, the great Maia watched all her movements, and during ten months unremittingly laboured for the safe preservation of the precious fruit of her womb.

---

[*] *Remark of the Burmese Translator.*—It is to be borne in mind that the mothers of Budhas, having had the singular privilege of giving birth to a child of so exalted a dignity, it would not be convenient or becoming, that other mortals should receive life in the same womb, they therefore always die seven days after their delivery and migrate to the abode of Nats, called Joocita. It is usual with other mothers to be delivered lying in an horizontal position and sometimes before or after the tenth month. But with the mother of a Budha, the case is not the same, the time of her confinement happens invariably at the beginning of the tenth month and that too in an erect and vertical position.

CHAPTER 3RD.

The time of her approaching confinement being close at hand the princess solicited from her husband, the prince Thoadodana, leave to go to the country of Dewah,[27] amongst her friends and relatives. As soon as her request was made known, the prince ordered that the whole extent of the road between Kapilawot and Dewah should be perfectly levelled and lined on both sides with plantain trees, and adorned with the finest ornaments. Jars full of the purest water, were to be deposited all along the road at short intervals. A chair of gold was made ready for conveying the princess, and a thousand noblemen, attended by an innumerable retinue, were directed to accompany her during the journey. Between the two countries an immense forest of lofty Juggieng trees extends at a great distance. As soon as the cortege reached it, the five water lilies shot forth spontaneously from the stem and the main branch of each tree; innumerable birds of all kinds by their melodious tunes filled the air with the most ravishing music. Trees similar in beauty to those growing in the seats of Nats, apparently sensible of the presence of the incarnated Buddha, seemed to share in the universal joy.

NOTES.

1 All Budhistic religious compositions begin with a short invocation to Budha himself, not unlike the *Bismillah* which is to be met with at the head of all Malay writings. It is always given in Pali, the sacred language of Budhism.

2 Budhists acknowledge three precious things, as deserving the highest respect and deepest veneration; Phra or Budha, his law, and the assembly of the perfect. Phra and Budha are two expressions which, though not having the same meaning, are used indiscriminately for designating the almost divine being, who after having gone, during myriads of successive existences, through the practise of all sorts of virtues, particularly self-denial and complete abnegation of all things, at last reaches to such height of intellectual attainments, that his mind becomes gifted with a perfect and universal intelligence or knowledge of all things. He is thus enabled to see and fathom the misery and wants of all mortal beings; and to devise means of relieving and filling them up. The law that he preaches, is the wholesome balm designed to cure all moral distempers. He preaches it with unremitting zeal during a certain number of years, and commissions his chosen disciples to carry on the same benevolent and useful undertaking. Having laid on a firm basis his religious institution, he arrives at the state of Niban. Budha means wise, intelligent. Phra is an expression conveying the highest sense of respect, which was applied originally only to the author of Budhism, but now through a servile adulation it is applied to the king, his ministers, all great personages, and often by inferiors to the lowest menials of government. The word Phra, coupled with the word Thaking, which means Lord, is used by Christians in Burmah to express the idea of God the Supreme being.

3. Ariahs are a class of beings who, by the practise and observance of the most exalted points of the law, have a state wherein they are free from the common destiny of other mortal beings. They are divided into eight classes, according to their respective degrees of perfection.

4. The Burmese translator of the Pali text gives us to understand, that his intention is not to give the history of our Budha during the countless existences that have preceded the last one, when he obtained the supreme intelligence. Budhists keep five hundred and ten histories or legends of Budha, purporting to give an account of as many of his former existences, and to enhance the value of such records, the contents are supposed to have been narrated by Budha himself to his

disciples and hearers. I have read most of them. Two hundred of those fabulous narrations are very short, and give few particulars regarding our Phra, when he was as yet in the state of animal, man and Nat. They are, except the heading and the conclusion, but the same fables and *contes* to be met with amongst all Asiatic nations, which have supplied with inexhaustible stores all ancient and modern fabulists. The last 10 narratives are really very complete and interesting stories of ten existences of Budha, during which he is supposed to have practised the ten great virtues, the acquisition of which is an indispensable qualification for obtaining the exalted dignity of Phra. Some of these legends are really beautiful, interesting, and well composed pieces of literature.

N. B.—The second object of general veneration and adoration proposed to Budhists is the law preached by Budha to all rational beings. It is supposed to be eternal, without any beginning, or author who might have framed its precepts. No Budha has ever been considered as the inventor or originator of that law. He who becomes a Bhuda is gifted with so great and wonderful intelligence, that he is enabled to come to the knowledge of all the precepts, dogmas, maxims and ceremonies constituting it. He is, therefore, the discoverer of a thing already existing, but placed far beyond the reach of human minds. At the time a Budha appears on earth, the very same law, preached by former Budhas, is completely forgotten; passions predominate all over the human race, darkening the mind and enslaving the heart.

5. Joocita is one of the seats of the Nats. But in order to render more intelligible several passages of this work, it is almost indispensable to have an idea of the system adopted by Budhists in assigning to rational beings their respective seats or abodes. There are 31 seats assigned to all beings, which we may suppose to be disposed on an immense scale extending from the bottom of the earth to an incommensurable height above us. At the foot we find the four states of punishment, viz. hell, the state of Athourikes, Preithas, and animals. Next comes the abode of man. Above it are the six seats of Nats. These eleven seats are called the seats of passion or concupiscence, because the beings residing therein are still subject to the influence of that passion, though not to an equal degree. Above the abodes of Nats, we meet with the 16 seats, called Rupa, disposed perpendicularly one above the other, to an incalculable height. The inhabitants of those fanciful regions are called Brahmas or perfect. They have freed themselves from concupiscence and almost all other passions, but still return some affection, matter and material things. Hence the denomination of Rupa, or matter, given to the seats. The remaining portion of the scale is occupied by the four seats called Arupa or immaterials, for the beings inhabiting them are entirely delivered from all passions. They have at it were broken asunder even the smallest ties that would attach them to this material world. They have reached the summit of perfection; one step farther, and they enter into the state Niban, the consummation, according to Budhists, of all perfection. To sum up all the above in a few words: There are four states of punishment. The seat of man is a place of probation and trial. The six abodes of Nats are places of sensual pleasures and enjoyments. In the 16 seats of Rupa are to be met those beings whose delights are of a more refined and almost purely spiritual nature, though retaining as yet some slight affections for matter. In the four seats of Arupa are located those beings who are wholly disentangled from material affections, who delight but in the sublimest contemplation, soaring, as it were, in the boundless regions of pure spiritualism.

6. Thingie is a number represented by a unit followed with 64 cyphers.

7. Budhists have different ways of classifying the series of worlds which they suppose to succeed to each other, after every revolution of nature is complete. As regards Budhas, who appear at unequal intervals for illuminating and opening the way to deliverance, to the then existing beings, worlds are divided into those which are favored with the presence of one or several Budhas, and those to which so eminent a benefit is denied. The present revolution of nature, which includes the period in which we live, has been privileged above all others. No less than five Budhas, as five shining suns, are to shoot forth rays of incomparable brilliancy and dispel the mist of thick darkness that encompasses all beings, according to their respective laws of demerits. Of these five, four, namely, Kaukassan, Gaunagong, Kattaba, Gaudama, have already performed their great task. This would now make the religious *regime* of the last named since the last 2350 years. The names of the 28 last Budhas are religiously preserved by Budhists, together with their age, their stature, the tree under which they have obtained the universal intelligence, their country, with the names of their father and mother, and those of their

two chief disciples. Deinpakara occupies the fourth place in the series. He is supposed to have been eighty cubits high, and to have lived 100,000 years.

8. Nat in Pali means Lord. Its signification is exactly equivalent to that of Dewa, Dewata. The Nats are an order of Beings in the Bhudistic system, occupying six seats or abodes of happiness—placed in rising up succession above the abode of man. They are spirits endowed with a body of so subtle and somewhat ethereal nature, as to be able to carry themselves with an urgent rapidity from their seats to that of man and vice versa. They play a conspicuous part in the affairs of this world and are supposed to exercise a considerable degree of influence over man and other creatures. Fear, superstition and ignorance have peopled all places with Nats. Every tree, forest, fountain, village, and town has its protecting Nat. Some among the Nats having lost their high station through misconduct, have been banished from their seats and doomed to drag a wretched existence in some gloomy recesses. They are called wicked Nats. Their power for doing evil is supposed to be very great. Hence the excessive dread for those evil genii entertained by all Budhists. A good deal of their commonest superstitious rites have been devised for propitiating those enemies to all happiness, and averting the calamitous disasters which they seem to keep hanging over our heads.

9. Yace, or Race, Raci or Ruthee means an hermit, a personage living by himself in some lonely and solitary recess, far from the contagious atmosphere of impure society, devoting his time to meditation and contemplation. His diet is of the coarsest kind, supplied to him by the forests he lives in, the skins of some wild animals afford him a sufficient dress. Most of those Race having reached an uncommon degree of spiritualised attainments, their bodies become spiritualised to a certain extent, which enables them to travel from place to place by following an aerial course. In all Budhistic legends, Race are often found interfering in the narrated stories and episodes.

10. The three great works are :—the assistance afforded to his parents and relatives ; the great offerings he had made, coupled with a strict observance of the most difficult points of the law, and benevolent dispositions towards all beings indiscriminately.

11. This extraordinary monarch, called Isikiawade, never makes his appearance during the period of time allotted to the publication and duration of the religious institutions of a Budha.

12. Here I make use of the expression Phralaong, or more correctly Phraalaong, to designate Budha before he obtained the supreme knowledge, when he was, as it were, slowly but gradually gravitating towards the centre of matchless perfection. In that state it is said of him that he is not as yet ripe.

13. The 10 great virtues or duties are liberality, observance of the precepts of the law, withdrawal in lonely places, wisdom, diligence, benevolence, patience, veracity, fortitude, and indifference. The five renouncements are ; renouncing children, wife, goods, life and oneself.

14. Metempsychosis is one of the fundamental dogmas of Budhism. That continual transition from one existence to another, from a state of happiness to one of unhappiness and vice versa, forms a circle encompassing the Budhist in every direction. He is doomed to fluctuate incessantly on the never settled waters of existences. Hence his ardent wishes to be delivered from that most pitiable position, and his earnest longings for the ever tranquil state of Niban, the way to which Budha alone can teach him by his precepts, and his examples.

15. The duration of a revolution of nature, or the time required for the formation of a world, its existence and destruction—is divided into four periods. The fourth period, or that which begins with the apparition of man on the earth, until its destruction, is divided into 64 parts called Andrakas. During one Andraka, the life of man increases gradually from 10 years to an almost innumerable number of years ; having reached its maximum of duration, it deviates slowly to its former short duration of 10 years. We live at present in that second part of an Andraka when the life of man is on the decline and decrease. If my memory serves me right, we have reached at present the 18th Andraka of the fourth period. Should the calculations of Budhists ever prove correct, the deluded visionaries who look forward for an approaching Millenium, have still to wait long ere their darling wishes be realized.

16. Our planet or globe is composed according to Budhists of the mountain Myin-mo being in height 82,000 youdzanas (1 youdzana is equal to little less than 12 English miles), above the surface of the earth, and the length in depth is equal to its height. Around this huge and tall elevation, are disposed the four great

islands, according to the four points of the compass; and each of these again is surrounded by 500 small islands. The countries south of the great chain of the Himalaya, are supposed to form the great island laying at the south.

17. A Rahanda is a being very far advanced in perfection, and gifted with high spiritual attainments which confer to his mortal frame certain distinguished prerogatives, becoming almost but spirits. Concupiscence is totally extinguished in a Rahanda, he may be said to be fit for the state Niban. Several classes are assigned to Rahandas according to the various degrees of advancement in the way of perfection.

18. It is an immutable decree that she on whom has been conferred the singular honor of giving birth to a mortal, who during the course of his existence is to become Budha, dies invariably 7 days after her delivery, migrating to one of the delightful seats of Nats. The Burmese translator observes that a womb that has been, as it were, consecrated and sanctified by the presence of a child of so exalted a dignity, can never become afterwards the hidden abode of less dignified beings. It must be confessed that the conception of Phralaong in his mother's womb, is wrapped up in a mysterious obscurity, which appears to exclude to idea of conjugal intercourse. The Cochin-Chinese in their religious legends pretend that Budha was conceived and born from Maia in a wonderful manner, not resembling at all what takes place according to the order of nature.

19. The Mount Himawonta is famous in all Budhistic compositions, as the scene where great and important events have happened. It is the Himalaya in all probability as being the highest range of mountains ever known to Indian Budhists.

20. Pounhas are the Brahmins who, even in those days of remote antiquity, were considered as the wisest in their generation. They had already monopolized the lucrative trade of fortune-tellers, astrologers, &c, and it appears that they have contrived to retain it up to our own days. During my stay in Burmah, I became acquainted with a young Pounha, wearing the white dress, and getting his livelihood by telling the horescopes of newly born infants, and even grown up people. I learned from him the mode of finding out by calculation the state of the parent at any given hour soever. This mode of calculation is entirely based on the Hindoo system and has evidently been borrowed from that people.

21. Preitha is a being in a state of punishment and sufferings, on account of sins committed in a former existence. He is doomed to live in the solitary recesses of uninhabited mountains, smarting under the pangs of never satiated hunger. His body and particularly his stomach are of gigantic dimensions, whilst his mouth is so small that a needle could scarcely be shoved into it.

22. In the Budhistic system of Cosmogony, 100,000 worlds form one system, subject to the same immutable changes and revolutions which affect this one which we inhabit. They admit indeed that the number of worlds is unlimited, but they assert that those forming one system are simultaneously destroyed, reproduced and perfected by virtue of certain eternal laws inherent to matter itself.

23. Isadoomaritz is the first of the six abodes of Nats. The description of the pleasures enjoyed by the inhabitants of that seat, is replete with accounts of the grossest licentiousness.

24. A Palon, or rather Bilon is a monster with human face, supposed to feed on human flesh. His eyes are of a deep red hue, and his body of so subtle a nature as never to project any shadow. Wonderful tales are told of this monster, which plays a considerable part in most of the Budhistic writings.

25. A Dzedi is a religious edifice of a conical form, supported on a square basis, and having its top covered with what the Burmese call an umbrella, resembling in its shape the musical instrument vulgarly called *Chapeau chinois*, by the French. On each side of the quadrangular basis are opened four niches in the direction of the four cardinal points, destined to receive statues of Budha. This monument is of every dimensions in size, from the smallest a few feet high, to the tallest of one or two hundred feet high, it is to be seen in every direction, and in the neighbourhood of towns, every elevation is crowned with one on several dzedis.

26. The Cabeit is an open mouthed pot, of a truncated spheroidical form made of earth, iron or brass, without ornaments, used by the Budhist Monks when going abroad in their morning excursions to receive the alms bestowed on them by the admirers of their holy mode of life.

27. This country of Dewah is one of the 16 countries so celebrated in the Budhistic annals, where the greatest religious events have taken place. They are placed in

the centre, north and northwest portions of the Indian Peninsula. In this place was born the celebrated Dewadut who become brother-in-law to Budha himself, but notwithstanding the close ties of relationship that united him to so saintly a personage, he is represented as the incarnation of evil, ever opposed to Budha in his benevolent designs in favor of human kind. At last in an attempt against his brother-in-law's life, he met with a condign punishment. The earth burst open under his feet, and surrounded by devouring flames, he rolled down to the bottom of the lowest hell, acknowledging however with the accents of a true but tardy repentance his errors and the unconquerable power of Budha. Three red hot iron bars transfix him perpendicularly, hanging him in an erect position, whilst three other bars pierce him horizontally through the shoulders and the sides. For his repentance he is to be delivered hereafter from those torments and restored to earth for acquiring merits that may entitle to a better place in future existences.

NARRATIVE OF A VOYAGE TO COCHIN CHINA.

By Charles Chapman, Esq.

[In 1777-8 the Captain of the Rumbold country ship, which made a voyage to Cochin China, reported favourably of that country as a mart for European commodities. He had brought with him two Cochin Chinese Mandarins of considerable rank, who were prevented landing in their own country by stress of weather, and were respectfully treated by the English at Calcutta; in cansequence of which Mr Hastings, then Governor-General, deputed Mr Chapman to Cochin China, to endeavour to open a commercial intercourse with the country. Mr Chapman returned to Bengal in 1779, having failed in the object of his mission and been in fact forced out of the country, escaping with some difficulty; but laid before the Bengal government a narrative of his proceedings, accompanied by valuable geographical and historical Memoranda.

A detailed account of Mr Chapman's Mission will be found in the following documents.

The following minute by the Governor General, Mr Hastings, details his reasons for proposing the mission :

"An accident having brought to this settlement two Mandarins of Cochin China, the one a near relation of the reigning prince, the other a man of considerable rank, humanity as well as policy induced the board to afford them every assistance their situation required, and to treat them with an attention which might impress them with a favourable opinion of the people they were come amongst, and to alleviate their anxiety at being separated from their country and families. The proper season for their return home is now arrived, and they are extremely anxious to set out: I have therefore not the least doubt that the board will concur with me in thinking it expedient to provide them with the means. It is true, the gentlemen in whose ship they came hither have fitted out a small vessel, and offered to send them back. This was incumbent on them, and no more would have been necessary had they been persons of less distinction; but a greater degree of attention is, I think, due to the relation of so considerable a prince as the king of Cochin China. I would therefore propose, that the Amazon Snow be got ready for their reception. I am induced to wish this for several reasons—That the vessel is at present unemployed, and may return from this service in the month of December—she will probably accommodate the Mandarins—she may be employed in a service of humanity, viz. the going in search of a part of the Earl of Temple's crew, thirteen men of which, I am credibly informed, still remain on the Paracel Islands, opposite to Cochin China—she may be directed to make any surveys, or proceed on any other service the board may deem necessary. The French chief of Chandernagore, sensible of the importance of these people, has, I am told, made them an offer of a vessel to return in.

The above, though I think them sufficient, are not my only motives for proposing to send the Amazon.

The owners of the vessel which brought the Mandarins have acquainted me that they understand from them, as well as other channels, that great advantages may be reaped from a commercial intercourse with Cochin China, and wishing to avail themselves of the present favourable opening for establishing a trade with that country, they propose sending a vessel and cargo, and earnestly request that a person may be deputed, in a public capacity, from this government, with the Mandarins, as a security to their property, and to procure the sanction of the ruling power of Cochin China to their future undertakings.

The advantages are represented to be—the extending the sale of Europe commodities, such as iron, lead, copper, cutlery, glass ware, and broad cloth, together with various manufactures of Bengal, to the Cochin Chinese, but more particularly to the Chinese junks; and the procuring returns in gold, silver, pepper, cinnamon, cassia, elephant's teeth, aquilla wood, and many other valuable articles, to the great benefit of this country, and which may in the course of time assist the investment to Europe.

The Company have always had in view the encouragement of a trade with the Chinese junks. This was Mr Dalrymple's object, when he proposed the settlement at Balambangan, and it was this allured the Company to incur so considerable expence as they did there. It is not now intended to subject them to any charge whatsoever, except the trifling one of maintaining a single gentleman as resident in Cochin China, which measure it is hoped may be productive of many of the advantages expected from the prosecution of that unfortunate scheme. I am informed that 70 or 80 junks resort to the single port of Turon in one season, and that the trade is the chief support of the town of Macao. That the country itself produces the several valuable articles above mentioned is evident, not only from the printed accounts of travellers who have visited it, and from the testimony of living witnesses now in Calcutta, but from samples of some of them in the possession of gentlemen who are desirous of venturing their property in the undertaking.

Cochin China is peculiarly happy in its situation for commerce. Possessing a large extent of coast of its own, it is within five days' sail of Canton; has the Philippines laying opposite to it; the great island of Borneo, the Molucca and Banda islands, a few degrees to the southeast, with Siam and Malacca to the westward. Its many excellent harbours would afford a safe retreat to our Indiamen when they might be so unfortunate as to lose their passage either to or from China, instead of being obliged to keep the most tempestuous seas with great risks to the ships and cargoes.

Satisfied, from the several particulars above recited, that advantages may accrue to this country, as well as to the British nation, from an intimate intercourse with Cochin China—that making the experiment will be attended with but a trifling expence—that there may never offer an opportunity equally favourable with the present—and that the arrival of these Mandarins may awaken the curiosity of foreign nations, which it seems has already been the case, from the offer made by the French chief of sending them back, I think it therefore a measure both prudent and politic to seize the present occasion, and to endeavour to form some kind of commercial alliance with the ruling power of that country, calculated to secure to the English superior privileges to the French or others; and for this purpose I propose that a person be sent, in a public capacity, with the Mandarins, to investigate the real state of their country, its sources for trade, and to discover what connection can be made with it advantageous to Bengal; and that he be likewise vested with powers, should he find the state of things answer the expectations formed of them, and agree with the accounts which have been given, to form a treaty of commerce on the part of this government with that of Cochin China.

(Signed) Warren Hastings.]

It may not be improper, before I give an account of this voyage, to mention the circumstances which led me to the undertaking, the reasons urged for the prosecution of it, and the advantages expected to be derived from it. Having stated these leading points, I shall proceed with a brief and faithful detail of the transactions in which I was engaged, from the time of my arrival on the coast of Cochin China to that of my leaving it; interspersing it with some observations on the country, its inhabitants and productions.

In the month of February 1778 two Mandarins* of Cochin China were brought to Calcutta in a country ship, called the Rumbold. The novelty of this circumstance excited the curiosity of the whole settlement. It was reported to the Governor-General by Messrs Croftes and Killican. These gentlemen who, I believe, were either the entire owners of the vessel, or partly concerned in it, likewise acquainted him that their visiting Bengal was accidental, and had happened in the following manner:—The Rumbold being destined on a voyage to China, her owners, in consequence of some favourable accounts of Cochin China, had directed the commander to touch on that coast in his way back. He went to the Bay of Turon, and during his stay there, application was made to him by Senhor Lorico a Jesuit Missionary, for a passage for himself to Bengal, and for two Mandarins of distinction, related to the Royal family. They wished to be landed at Donai, the most southern province of Cochin China, whither the the king had retired on account of an invasion of the northern provinces by the Tonquinese, and a rebellion which had broken out in several of the midland provinces. The commander having heard that Senhor Lorico was highly esteemed by the natives, and had behaved with great humanity to the officers and crew of the Admiral Pocock Indiaman, when driven into Turon Bay by stress of weather, in the year 1764, complied with his request. He soon after weighed anchor, intending to land the Mandarins at Donai; but a strong current and violent gale coming on, forced the ship so far to the southward of that province, that he was unable to make it, and he was obliged to bring all his passengers to Bengal.

---

* Mandarin is a Portuguese word, derived from the Verb "Mandar," to command. It is totally unknown amongst the Chinese, the Cochin Chinese, and Tonquinese: The word used by all those nations for a person in authority is "Quan."

The following morning the Mandarins and Senhor Lorico were introduced to the Governor General, by whom they were received with the greatest attention and humanity, and re-assured by expressions of goodwill, necessary to give them confidence in the people they were come amongst. They were given a house, servants, and every necessary; they were shewn everything curious in the settlement; and treated in such a manner, that the time they passed amongst us proved highly agreeable to them.

The Mandarins remained in Bengal till the middle of April. In the interim, Messrs Croftes and Killican had equipped a small vessel, of between 70 and 80 tons burthen, to carry them back. Some days before the time fixed for their departure, I was requested by Mr Croftes to suggest to the Governor-General how acceptable a small present from him would be to the Mandarins. This I took the first convenient opportunity of doing; and he was not only pleased to acquiesce in it, but also signified his intention of sending something handsome to their king, and desired that I would consult Messrs Croftes and Killican upon what articles would be suitable for this purpose, and that I would bring him a list of them. While we were adjusting this matter, our conversation naturally turned upon Cochin China. In the course of it, these gentlemen expatiated upon the advantages which might accrue to Bengal, and to the Company, if a commercial intercourse was opened with the country; enumerated the several valuable commodities it produced, and expressed their wishes that the present favourable occasion might not be neglected of forming a connection with the Government of it. Pleased with the hopes of distinguishing myself, I declared that I would readily undertake the voyage, if the Supreme Council should think it proper to send me in a public capacity. Some conversations I had afterwards with these gentlemen, their communicating to me some papers relative to the country, with the accounts given by the Commander of the Rumbold, and the assurances of the Mandarins, confirmed me in my resolution of undertaking the voyage; and I made the proposal the Governor-General; I requested that he would be pleased to speak to Messrs Croftes and Killican on the subject, and the representations these gentlemen made both to the Governor General and other gentlemen of the Supreme Council, brought them to approve of their plan. The Amazon, a small Snow belonging to the Company, was ordered to be made ready for the accommodation of the Mandarins. The companions of my voyage were Mr Bayard, a gentleman of the Company's Service, Mr Totty, a Surgeon, Captain Maclennan, Master of the Amazon, and Captain Hutton, Master of the Jenny.

The end proposed by my appointment was the establishment of a commercial intercourse between the Company's Settlements in India and Cochin China, and the attainment of such privileges and advantages to our vessels importing thither, as we might find the Government disposed to grant. The benefits hoped from this intercourse was the larger exportation of the commodities of Europe and India to that country, and the importation of its valuable productions in return.

Having thus explained the inducements to this voyage, I shall proceed to a detail of the transactions which occurred in the prosecution of it.

The Amazon having fallen down to Budge-Budge, I embarked the 16th of April, with the principal Mandarin, and five or six of his attendants. The other, by his own desire, went on board the little vessel first prepared for them both. She sailed a few days before us, and was to rejoin us in the Straits of Malacca, from whence she was to accompany us during the remainder of the voyage. We had on board some specimens of the commodities of Europe and India, by which we might judge what would be most in request in the country we were bound to. Bad weather, and the want of a sloop, did not permit us to dismiss our pilot until the 29th, when we were obliged to send him on shore at Ballasore. Exactly a month after this, we anchored at Malacca, and sailed from thence the 2nd of June for Tringano, a Malay port on the other side of the Peninsula; we reached it the 12th following. Here Mr Hutton informed me of the death of the Mandarin, his passenger, which happened a few days after leaving Malacca. This accident gave me a good deal of concern, as he was a sensible, steady, well-behaved man, and I relied much on him for assistance amongst his countrymen. We found at this place thirty or forty natives of Cochin China, whose vessel had been driven off their own coast, and wrecked near Tringano. According to the policy of the Malays, they were become their slaves, and their effects the property of the Rajah; they gave our Mandarin some information relative to the state of his country after his leaving it, but indistinct and little to his satisfaction. I endeavoured to procure the release of some of these poor people, and was not a little surprised at a seeming backwardness in them to accept it. During our stay here, I was spoken to by the King's brother (the King being absent) concerning the Company's establishing a factory at Tringano; and I heard on my return to Malacca, that there had been a letter sent to the Supreme Council with this proposal. This complaisance arises from the King's apprehensions of a hostile visit from the King of Rhio, and from a desire of extending his territories by means of the Company's assistance. If it were thought worth while to settle in any part of the Peninsula of Malay, a more eligible situation than Tringano might be found. Some months in the year this is a dangerous lee shore, and inaccessible to shipping. I do not think that establishments can be made by us with any advantage among the Malays.* At Tringano they purchase annually two hundred chests of Opium, some white goods, a small quantity of iron and copper, and a few other articles of little note; for these things they give in exchange, pepper, gold and tin; the latter article is not the produce of the place, but carried thither by Malay and Bugis prows.

Our stay at Tringano being prolonged a day or two, that we might furnish ourselves with a good store of refreshments, as we expected but scanty supplies at Cochin China, we did not weigh anchor till the 17th. The 20th we came in sight of Pulo Ubi. The next we anchored close to it, and the following day found ourselves in the latitude of 8° 35' N. which must have been nearly the latitude of the point of Cambodia, as it then bore West of us; it is laid down by our Geographers and Hydrographers 10 or 15 miles more to the northward. Pulo Ubi is a small island, seen from a great distance, situated exactly on the eastern extremity of the Gulf of Siam. My intention in taking this route was, that we might have an opportunity of coasting the southern shore of Cambodia, which is but little known; of entering the western branch of the great river which separates that country from Cochin China, where I expected certain accounts of the state of that country; and of procuring an interview with the king, who was said to be at Donai, the southern-most province.

We were but a little more than two days going from Pulo Ubi to Cambodia river. The point of Cambodia, as well as the whole coast from thence to the mouth of the western branch of the river, is covered with underwood, and exceedingly low. The water is so shallow, that at the distance of five or six miles from the shore we rarely had more than four fathoms. Although the commander of the small vessel, our consort, made repeated attempts he could never approach the shore nearer than two or three miles. Few inhabitants appeared, and only two boats near the entrance of the river. Our boat was sent to speak to them, but they being poor Chinese fishermen, they could not understand our Cochin Chinese linguist.

---

* It is only a few years since the Presidency of Fort St George attempted a settlement at Acheen, under the conduct of the Honorable Edward Moucton, but were obliged to withdraw it.

The 24th of June, we anchored in sight of the mouth of the west channel of Cambodia river, between three and four o'clock in the afternoon, in barely three fathom water, a strong ebb tide setting out: the tide to the westward had been observed the preceding evening to rise two fathoms and a half; it therefore certainly behoved us to be on our guard against its falling as much: the Captain was apprised of this by his officer, but he making light of it, the tide by six o'clock left the vessel fast aground; but as she lay in soft mud, our situation was by no means dangerous. The Captain made sail as soon as the vessel floated in a dark night, uncertain whither a rapid tide might drive us. The vessel grounded a second time; and when the floating tide relieved her from this, still a third time. Here, or on some other part of the shore, I expected we must have left the vessel; her head was only in a fathom and a half of water, and her stern was beating upon a sand as hard as a rock. The boat with the Chief Officer and most of the Europeans was now sent to sound; during their absence the water rose to two fathoms and a quarter; the Amazon drew twelve feet; the flood tide was fully made. Anxious after our boat, we made signal after signal for it to return; and when it did, the report of the officer was far from satisfactory, having met with shoals all round. There was now the appearance of a hard squall coming on; the man with the sounding line warned us there was but a few inches more than the vessel drew; and it being the top of high water of a spring tide, we had no prospect of further relief. Happily, however, we increased the depth, and the squall coming on, presently drove us into five fathoms, where we dropt our anchor.

After the fatigue and anxiety which we suffered the preceeding night, we were happy to devote this day, the 25th, to repose.

The 26th, I went on board the Jenny, which lay at a considerable distance from our vessel, near the mouth of the river. The commander acquainted me he had sent his boat into the river for intelligence, and proposed to me to stand in and meet it. Having no objection, he weighed his anchor: as soon as we opened the first reach, we perceived a vessel an anchor, and the boat making towards us: we continued our course in a good channel of three and four fathoms water, as far as the tide would permit us. By the officer who went in the boat, we learned that the vessel in sight was a Portuguese Snow from Macao; that there was another higher up at a village called Bathai; and that a ship had left the river seven or eight days before. Mr Moniz, (a Portuguese gentleman I before mentioned to have accompanied the

Mandarin to Bengal,) who went on board the Portuguese vessel, acquainted me, that he heard from the commander, that the rebel Ignaack had carried everything before him in Cochin China; that the King having fled to Pulo Condore, had been taken there, and put to death; and that his brother had fallen into the hands of the usurper, who obliged him to marry his daughter. I afterwards found that his brother was the elder of the two sons left by the late King; but that Quick Foe, the Prime Minister, who had acquired an unbounded influence in the latter part of the reign, had married his daughter to the younger prince, and contrived, upon the death of the old King, to place his son-in-law upon the throne. This, with the Minister's unpopular measure of imposing a poll tax upon all the native inhabitants, of whatsoever age, sex, or condition, was the cause of the troubles which broke out in the interior provinces, and furnished a pretext for the Tonquinese to invade the country; for when the army entered the northern provinces, they declared their designs to be solely bent against the person of the Minister, whose mal-administration had involved his country in a civil war, and promised, upon his being delivered up to them, to assist the King in subduing all his other enemies; the young King, instigated by the enemies of this Minister, blindly fell into the snare, and thereby proved to have acted as politically as the sheep who delivered their dog to the wolves. Quick Foe, though a bad man, was allowed to be a man of abilities, and by the discerning esteemed the only one capable of making head against the dangers that now threatened the King on all sides. Sensible of this, the Tonquinese, as soon as he was delivered into their hands, treated him with the utmost deference, and made use of his knowledge to possess themselves of the country. They immediately laid siege to Hue, the capital, and took it; the King fled to Donai; from hence to Pulo Condore, where he was taken and put to death. The Minister was carried to Tonquin, where he was allowed to enjoy an honourable retreat.

The next day I returned on board the Amason, to prepare a few necessaries to go up to Bathai in the Jenny, and desired Captain Hutton to wait for me where he was. Early in the morning I set out, accompanied by Mr Bayard and Mr Totty: on approaching the river, I perceived the Jenny running out with the Portuguese Snow. Expressing my surprise at this, I found Captain Hutton had received intelligence, that some persons he had left at Turon the year before had been put to death by Ignaack, and that 20 or 30 of his gallies were then cruizing in a branch of the river, two days sail from Bathai. Unacquainted with the force of these galleys, and having too much reason, from the information, to suspect their hostile disposition towards us, especially if they were apprized of our having a relation of the late King on board, and the Amazon being deemed to draw too much water, and built too sharp to be brought into the river, I thought it most prudent to drop my design of proceeding to Bathai. Understanding, however, that there was still a party of the King's people making head against Ignaack in Donai, it was determined to proceed thither, in order to place our Mandarin and his people amongst their friends. Captain Hutton having received what instructions the Portuguese Captain could give him respecting the passage (no pilot being to be had); was to lead the way we were to follow: these points adjusted, I returned on board my own vessel, and the next morning we sailed.

The first of July we anchored under a promontory, supposed to be Cape St. James, about a degree and a half distant fron the West Channel of Cambodia river. This was the first high land on the continent we met with. Here again we were all at a stand, nobody being able to point out the road to Donai: the Mandarin and his people, never having been there, could give us no information. Vexed at my disappointment, I determined to go on shore myself in our pinnance, and to endeavour to gain some intelligence. Mr Bayard and the second officer accompanied me: I took two of the Mandarin's servants as linguists. When we reached the beach, I sent the linguists on shore, keeping every body else in the boat; after some time they came back, leading two or three of the most miserable looking objects I ever beheld, upon the very point of perishing with hunger and disease. The linguists telling us we might land in safety, we did so. These poor wretches acquainted me that they belonged to a village hard by, in which were left about fifty more, much in the same condition as themselves; that a fleet of Ignaack's in its way to Donai, which it was now blockading, had, two months before, paid them a visit, and plundered them of the scanty remains left by a horrid famine, supposed in the preceding year to have carried off more than one half of the whole inhabitants of Cochin China; and that they had nothing to eat now but a root thrown up by the surf on the beach, which caused them to break out in blotches all over their bodies; it was shaped something like a sweet potatoe, but longer. I was now no longer at a loss to account for the indifference the wretches I saw at Tringano shewed to my offer of procuring their release; they were not possessed of sufficient patriotism to prefer liberty with so scanty a fare in their own country, to slavery with a full belly in a foreign one. There is no slavery in Cochin China. On perceiving the mouths of two or three rivers to the N.W. and asking their names, they told me one of them led to Donai. Several more of these objects were now gathering round me: distressed at this scene of misery not in my power to relieve, I hastened to board my boat, and took with me an old man, who appeared the most intelligent, to inform our Mandarin of all he knew, and to enable us to determine what was next to be done.

A comfortable meal having cheered up the old man's spirits, he had a long conversation with his countryman; the result of which was, that a village called Huttien, a few hours sail from where we then were, having resisted the attacks of Ignaack's fleet, the Mandarin was desirous of going to it, hoping to get some satisfactory intelligence of his friends: thither we bent our course, the old man serving as a pilot; the next morning we anchored abreast of it. A number of fishing boats hovered about the vessel, but kept aloof till two of the Mandarin's servants were sent to them in a small prow; they then came, to the number of fourteen or fifteen. Our Mandarin sent a message to the chief of the village by them. The people in these boats were stout personable men, and had not the least appearance of want amongst them. Every boat was well furnished with bows and arrows, swords, and lances. In the afternoon, the Mandarin of the village sent his compliments to our Mandarin, with a present of beetle and apologized for not waiting upon him in person, on account of his being much indisposed. Our Mandarin being so well satisfied, that he determined to go on shore next morning, myself and the other gentlemen promised to attend him.

Having sent the Mandarin of the village notice of our intentions, early in the morning some boats came from the shore to conduct us to the landing-place. Our Mandarin's servants, who went on shore the evening before, and staid all night, came with them, and gave their master a favourable account of the inhabitants. They also brought on board with them a man who had formerly served as a soldier under the Mandarin's command. He seemed transported with joy on recognizing his old master. After breakfast we set out, the soldier sitting at the Mandarin's feet; and during our passage towards the shore, he recounted to his master the particulars of Ignaack's successes, the king's death, and how the people of this district had repulsed the rebel fleet. He acquainted him, that the king's brother, whom they called Antoine, dissatisfied with his wife, and the restraint he was kept under, had found means to escape from Ignaack, and was gone in arms with a considerable force into Benthoan. Yet before the boat reached the shore, our Mandarin was seized with a panic, which I never could learn the real cause of, and desired me to put about and return to the Vessel. Unable to conceive his motives, his own servants assuring me there was no cause of apprehension, we continued our course till the pinnace came into shallow water and could proceed no further. Here we were preparing to get into a country boat, when the Mandarin caught hold of my clothes, earnestly entreating me to desist, crying out "Tyson! Tyson!" which is the name the adherents of Ignaack go by in the country. Mr Moniz seeing this, offered to go on shore to learn who the people really were; Mr Bayard accompanied him. They soon came back, with the principal Mandarin of the village. He came in to our boat, and invited our Mandarin on shore; the soldier offered to remain an hostage, and to forfeit his head if any harm befel him. All was insufficient to remove his fears; he still cried out, louder than ever, to put back. Finding his timidity not to be overcome, I asked the Mandarin of the village to go with us to see our vessel; he did not hesitate. After he had been on board a short time, he complained of being very sick; I therefore dismissed him, first making him a small present.

We then left the village of Huttien, and continued our course along shore six or seven days, and anchored at a fishing village near Pulo Cambir de Terre, to enquire for water and other refreshments; but the water being very brackish, one of our fishermen offering to pilot us to Quinion, where plenty of good water and fresh provisions might be had, we accordingly proceeded thither. No sooner did our Mandarin learn that we intended to touch at Quinion, than he rushed from the cabin in a most distracted manner; and threw himself at my feet, when he informed me that Quinion was the province in which Ignaack resided, and that its harbour, to which we were going, was the rendezvous of his fleet. It did not, however, prevent me from proceeding, as I knew that the greatest part of Ignaack's Force was to the southward. We continued our course, and the 13th July we anchored in the Bay. The coast, in many places highly cultivated, had now a most delightful appearance; the lowlands planted with paddy, and the hills with pepper to their very tops.

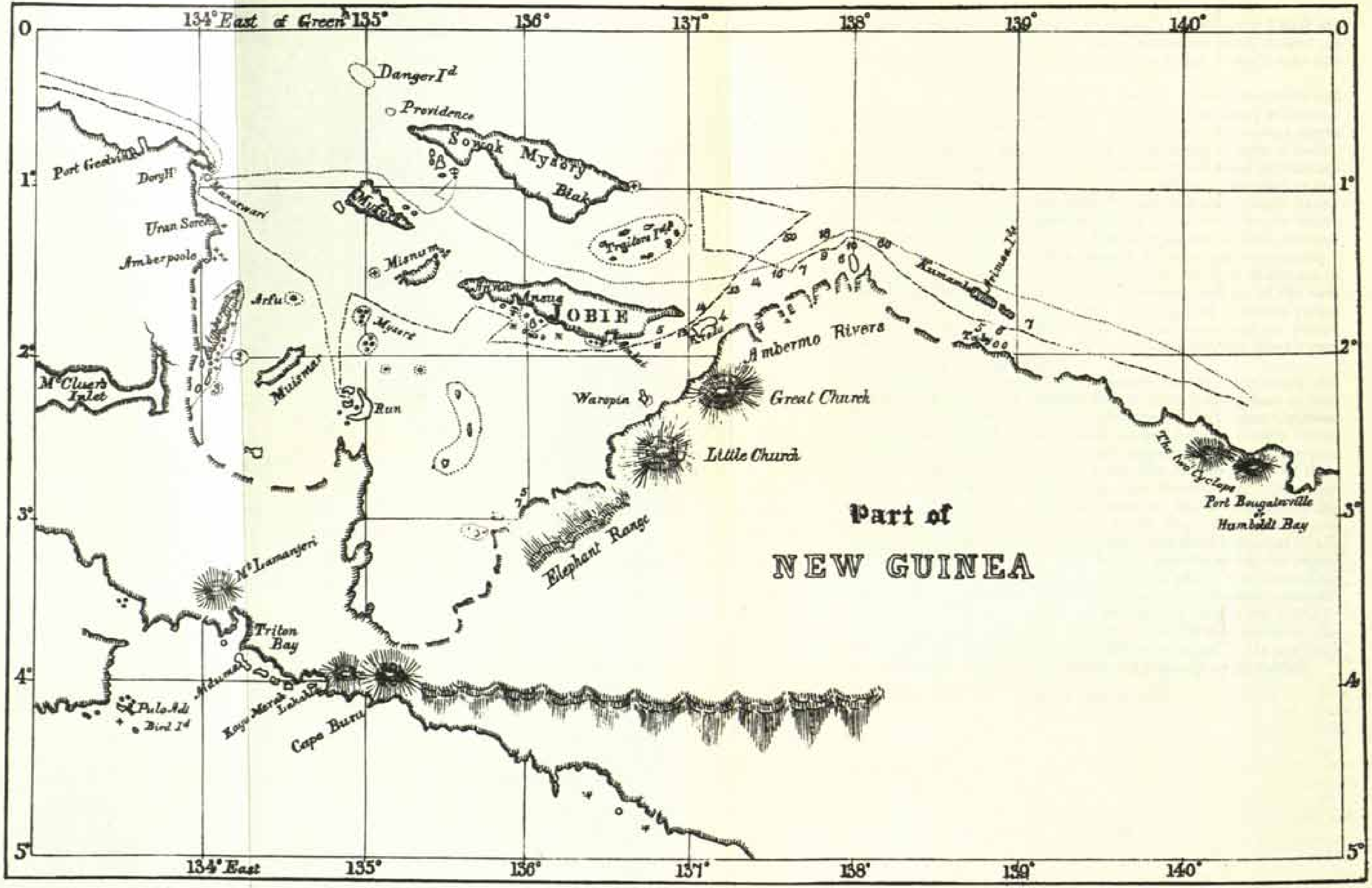
Here we found two Portuguese Snows; and the supercargo of one of them coming on board a little before we anchored, I understood from him that we had nothing to fear; on the contrary, that Ignaack himself was exceedingly alarmed at our arrival, and would be well satisfied to find that we had no hostile intention against him, which he was in dread of, from what had happened last year at Turon. This dispute arose from the rebels attacking and taking a boat, conveying military stores from an English ship to the royal party. The king's party having received a signal defeat while the ship lay in the harbour, the Mandarins fled on board for protection, and induced the commander to undertake to carry them to Donai, by promising to indemnify him for the loss when he arrived there. How they were disappointed and brought to Bengal, I have before related. As soon as we anchored, I sent a young man, who served me as a writer, on shore, with my compliments to the Mandarin in charge of the fort, to acquaint him that the vessel belonged to the English government of Bengal, and that our business in Cochin China was to settle a friendly intercourse and commerce between the two countries. In the evening he returned with a very heavy civil answer from the Mandarin, purporting that he should immediately send notice af our arrival to the King (Ignaack), and that in the meantime we were wel. come to furnish ourselves with water and all other refreshments the place afforded. Next day the Mandarin himself came on board, and brought me a present of a hog. Ever after he visited me daily during our stay. He was a jolly man, of between 50 and 60 years of age. By his desire, I sent my writer on shore to go with him to the King's brother, who lived near, to whom I sent a present of a piece of muslin, two pieces of chintz, and some bottles of liquor. On his return, he acquainted me that he had been graciously received, and assured me that the king was exceedingly well disposed towards the English, and wouldnot fail to treat me with the most honourable distinction; and that the king's son-in-law, who was Prime minister, would come down to see me in a few days.

He accordingly arrived the 16th, and the next morning, having received an invitation, I landed to make him a visit. We were met on the beach by the Mandarin of the port, who conducted us to a large straw shed, which he informed me was his house, where his highness was waiting to receive us. On each side of the entrance were drawn up twelve of his guards, dressed in blue linen, and a kind of helmet on their heads, made either of leather or of paper, lacquered over, and ornamented with flowers and devices of block tin, as were the hilts and scabbards of their swords, so that they made a regular if not a martial appearance. On our entrance we found a young man of a pleasing aspect, seated cross-legged upon a low table. He rose on our approach, and pointed to some chairs which were placed on each side of him for our accommodation. After a few ordinary questions on his side, as—Whence we came? —What had brought us to Cochin China?—How long we had been on our passage? &c.,—I acquainted him I was servant of the English Government in Bengal, to which the vessel I came in belonged; that my business in Cochin China was to settle a friendly intercourse and commerce between the two countries, which I made no doubt would be for the advantage of both. I then desired to know, whether he was authorized to inform me upon what conditious such commerce could be carried on to the ports in their possession? Instead of answering me, he desired to know what presents I had brought for the King, and whether I intended to go to court? I told him, I would go, if the King sent me an invitation, and carry such presents with me as I hoped would be acceptable. I presented him with a pair of neat pistols, and some pieces of cloth, &c. I could now get him to talk of nothing but presents. Before we parted, I applied to him for the use of a straw hut near the watering place; he told me he was not authorized to grant it. He then informed me he should return to court the next day, and invited me to accompany him. I begged to be excused, as I wished, before I set out, to receive an invitation from the King. He appeared rather hurt at this, fearing I suspected he had not authority to invite me. I observed that his refusal of so mere a trifle as a hut to live in, which I offered to pay for, was almost sufficient to doubt it. Soon after I took my leave, when he assured me he would desire his father to send me an invitation without delay; and as for a house, I might take any one I choose in the place.

Three days after I received a formal written invitation and safe-conduct from Ignaack; it was brought on board with great ceremony by several Mandarins. They desired the colours might be hoisted on the occasion, an umbrella raised to open it under, and that I should stand up to receive it; all these requisitions being complied with, it was opened, read, and presented to me. The Mandarins did not fail hinting to me how exceedingly happy the bearers of this distinguishing mark of the royal favour would be to receive some token of acknowledgement for their trouble. Having treated them wtth a dessert of wine and sweetmeats, I dismissed them satisfied, first settling with the Port Mandarin to be on shore next evening, sleep at his house, and set off the next morning for the royal residence. He engaged to have a palanquin ready for me, horses for the two gentlemen and my writer, who were to be of the party, and coolies to carry the King's presents and our own necessaries.

"When his invitation was exclaimed to me, I was much surprised to find that his Majesty should think it incumbent on him to account to me how he became possessed of his present dignities. It began by setting forth, "That the late king of Cochin China " and his ministers having, by their oppressions, starved the peo- " ple, it had pleased God to make him the instrument of their " deliverence, and to raise him to the throne," &c. Our poor unfortunate Mandarin, who was now on board incog., and, the better to conceal himself, dressed in an English dress, his beard shaved, his teeth cleaned, and, what distressed him most of all, his nails reduced three or four inches, desiring to see the paper, told me, with tears in his eyes, that the seal affixed was the ancient seal of the kings of Cochin China, which the villanous possessor had stolen; that the reasons he assigned for seizing the Government were false; and that he alone was the sole author of the calamities his country had and still experienced. He conjured me not to trust myself in his power, for I should never return.

(To be Continued.)



Lith Singapore Free Press Office

THE
JOURNAL
OF
THE INDIAN ARCHIPELAGO
AND
EASTERN ASIA.

CONTRIBUTION TO THE KNOWLEDGE OF THE NORTH AND EAST COASTS OF NEW GUINEA.*

By G. F. De Bruijn Kops, Lieut. Dutch R. N.

In the year 1849, Mr Van Den Dungen Gronovius was charged with a mission to the coasts of New Guinea, and H. N. M. schooner Circe, under the command of Lieutenant Brutel de la Rivière was appointed to convey him to Amboyna. Being attached to this vessel, I took part in the important voyage to New Guinea which she subsequently performed, and collected the particulars given in the following pages.

After a long and unimportant passage, during which the crew suffered from an epidemic which carried off two of their number and obliged us to leave seven others in the hospital of Makassar, we arrived at Amboyna, and were there appointed to proceed with the mission to New Guinea. It were to be wished that a more weatherly, stronger, and better manned vessel than the Circe should have been employed for this service, but one of the brigantines stationed in the Molucca Seas had lost her foremast, and the other was under orders to proceed to the south coast of Ceram.

Having been provisioned for five months, we left Amboyna on the 16th of December, in the hope of being able to perform the voyage along the north coast of New Guinea with the westerly monsoon which now prevailed, so as to be able to return at our leisure on the setting in of the easterly monsoon; but in this various circumstances contributed to disappoint us. Our first destination was Ternate in order to make some arrangements with the Sultan of Tidore, who, as chief of the coast of New Guinea, was interested in the mission.

---

* Translated for this journal from the Natuurkundig Tijdschrift voor Nederlandsch Indie.

After passing through the Strait of Manipa, a strong easterly current drove us down under Obi Major. Heavy squalls from the north-west, and a current of 1½ (English) miles per hour, thwarted all our endeavours to get to the westward, so that on the 24th of December, we found ourselves off Wahaai.* Our efforts to work up close under the land were also fruitless, for on reaching Nusa Ella, a group of small islands on the west side of Sawaai Bay, and trying to pass them to the northward, we were again swept away to the eastward by the current. The weather continued squally from the N. W. with heavy rains and a jumping sea, which caused our old, cranky vessel to suffer considerably. Finding it impossible to beat to windward with so unseaworthy a vessel, and considering that should we be driven past Wahaai no other resource would be left than to bear up at once to New Guinea, it was determined on the 28th to put into Wahaai, and send information to Amboyna of the circumstances under which we were placed. We anchored at noon of the same day, and the report were dispatched forthwith. Mr Faes, the clerk of Mr Gronovius, volunteered to undertake this service, and departed, with the necessary escort to Sleman in the Bay of Sawaai, when he crossed the mountains to Makriki, in the Bay of Ambaai, on the south coast of Ceram, and thence by water to Saparua, Hitu, and Amboyna, which place he reached on the 10th of January. On the 22nd of the month we received orders from the commandant of the station, who was then at El Paputi, to try and reach Ternate when the current should decrease, to which place he would forward three months additional provisions.

A few days subsequently we learned from a native who arrived in his prahu from the eastern islands, that he had met the English frigate Mæander near Ceram, coming from Port Essington, and bound to the north coast of New Guinea.†

According to the unanimous evidence of the natives, the current changed its direction in February, and commenced running to the westward, which would enable a vessel to work up against the monsoon with tolerable facility. We repeatedly sent boats out to try, but they invariably found the current still running to the eastward. Nevertheless we left Wahaai on the 13th of February, and when 10 or 12 miles in the offing, found, sure enough, that the current set to the westward, although not with great strength. With its aid we arrived once more on the 16th under the coast of Obi, and passing between the island of Lukisong and Gasses, entered the Strait of Patientia, on the 20th. On the following day the current carried us through the passage between the coast of Bachian, and the westernmost of the chain of islands in the northern part of the strait. Thence we worked up between the island and the coast of Gilolo, finding the channel perfectly clear, so that a vessel could stand in within pistol-shot of each shore, and anchored on the 25th February in the road of Ternate. Here we met Mr Faes who had arrived a few days before us, and found the goods intended for presents to the New Guinea people, which had not arrived when we left Amboyna. These goods, which were intended for the disbursements of the vessel during her voyage as well as for presents, consisted of white and coloured beads of different sizes, rolls of brass-wire, cast-iron pans, (*kwallies*) sealing knives, calicoes, choppars, parangs, patjols, and iron crows.

---

* A port and settlement of the Dutch on the north side of Ceram.—*Tr.*

† The Mæander had the late garrison of Port Essington on board, the establishment having been broken up, and was bound to Sydney by the northern route round New Guinea.—*Tr.*

Shortly after our arrival the official visit to the Sultan of Tidore took place, when it was determined that several kora-koras (covered prahus) should be got ready to accompany us, and the necessary orders be given to the Singaji of Gebi, as subordinate chief of the Papuan conntry, as well as to the various local chiefs upon the coast. One of the Tidore princes, Captain Amir, was to accompany us with two prahus, and a third was to be dispatched to the west coast. In addition to this, Mr Gronovius received a "safe conduct" from the Sultan, which contained instructions to all his subjects to render us every assistance.

All being prepared, we sailed from Ternate on the 16th of March, and passed through the Straits of Patientia and Dammer. The latter, which is formed by Dammer Island and the south point of Gilolo, is a clear and spacious channel, wider than is indicated in the charts. Having passed through this strait, we found a strong current running to the north, which carried us close up to Cape Mabo. On the evening of the 19th we came to an anchor under Gebi Island, and on the following morning got under weigh and stood further in between Fow and Gebi. This anchorage is one of the best and safest in the entire Archipelago. Being shut in on all sides, neither sea nor winds are to be cared for. The bottom consists of sand. In the western entrance there is between 15 and 20 fathoms water in mid-channel, but the depth decreases towards the shore, where small reefs exist close to the land.

In the western entrance there is a reef and sand-bank, with a channel on each side, the most spacious being that on the Gebi shore. The eastern entrance is contracted by a reef which extends out to mid-channel. This anchorage is frequented by ships bound to China by the Eastern Passage, and by whaling vessels, for the purpose of obtaining wood and water. A short time ago the harbour was visited by an English ship of the line.

The coast hereabouts is uninhabited, no signs of population being visible except now and then a little canoe manned by natives, bringing fish and fruit to barter for buttons, empty bottles, pieces of copper, and similar articles. The kampong or village, Kechepi is situated on the N.E. side of the island on a sandy beach at the foot of a hill. A coral reef extends out from the beach, on which a surf is always breaking, and there is no anchorage. About 2 miles from the kampong lie two small low islands, called Juy and Utta, where the inhabitants have their gardens, and partly reside. The Singaji lives in the chief kampong.

Some years ago, the Sultan of Tidore sent an expedition to Gebi to punish the inhabitants for piracy, when a great part of the inhabitants were slaughtered. Those who escaped took up their residence on Juy, and have only lately returned to the campong. The Singaji of Gebi was thus brought under the rule of the Sultan. Formerly he was independent, and had made his name feared and celebrated by his piratical feats. It is said that he could once send 300 vessels to sea, fully manned and provided. On one of his expeditions he conquered the coast of New Guinea, where his authority as supreme chief is still recognized, so that the orders of the Sultan must always be carried out through his instrumentality.

On our arrival, notice was sent to the Singaji, who arrived on board the following day, accompanied by his chiefs, in two prahus. The Singaji, a little, active, old man, and his son, were clad after the European fashion, with black coat, breeches, waistcoat, stockings and shoes, with a black kerchief round the head in which some silver rings were stuck. The other chiefs wore the kabaya, trowsers, and headkerchief, and the rowers, who were all Papuans, only the chawat or waist-cloth. Nearly all the chiefs spoke Malayan, the Singaji and his son being very fluent. The latter accompanied Mr Gronovius to the Kampong Kechepi, which is distant 7 or 8 hours' journey by sea. The route overland is shorter, but more difficult, as it is necessary to cross the hills, and there is no beaten track. The village is small and poverty-stricken, consisting of about twenty houses constructed of gaba-gaba and atap,* after the common fashion. The population, consisting partly of natives of Ternate and partly of Papuans, are either professors of Islamism or Pagans. Fish, sago, and yams constitute their chief food, and they also cultivate rice, edible roots, and fruit in very small quantities. With the exception of fish and a few fruits, there are no refreshments to be obtained here.

---

* *Gaba-gaba* is the stem of the leaf of the sago palm, much used throughout the Moluccas for building and fencing. *Atap* is thatch made of the fringe of palm leaves, doubled down and sewed on sticks or lathes of bambu.

The Singaji sent us a present of a sheep, which proved very palatable. The inhabitants busy themselves chiefly with the trepang and pearl fisheries.

The island Fow, which lies in a bight of the south coast of Gebi, is penetrated by a narrow but deep inlet, extending north and south, which nearly divides it in two, the isthmus consisting of a hill from 350 to 400 feet in height. The depth of water in this cove varies from 5 to 10 fathoms. The entrance, which is contracted by reefs extending from each shore, is exceedingly narrow, being scarcely more than a quarter of a cable's length in width, but it opens out after entering, and forms an inlet of 5 cable's-length long, and 8 broad. This inlet would be invaluable if situated on the coast of Java, where a secure harbour in which a respectable number of vessels could lie as if in a dock, is much required. Nothing could be easier than to form a maritime establishment here, and the shipping could be well defended. It is a drawback, however, that there is no fresh water on the shores of the bay, but this might be remedied by digging wells.

The kind communications of C. F. A. Schneider, medical officer of the 3rd class, have placed me in a position to offer certain zoological, botanical, and mineralogical observations on the countries visited during the present voyage. The following data are the result of his researches :

On Fow Island, the ground consists of "Thonschiefer" mixed with oxide of iron. The latter metal exists in the form of red-ironstone, (Thoneisenstein) magnetic iron and sulphuret of iron (Zwavelijzer) besides a little "glimmer." Wherever the ground is exposed, it is of a dark reddish-brown colour :—hence the hill on the south side of the island can be recognised from a long distance. Notwithstanding the metallic nature of the soil, the vegetation and the Flora are very rich. A belt of mangroves (Rhizophores) borders the bay, and on the east side of the entrance there is a grove of tall straight trees, from 60 to 70 feet in height, which appear to be well adapted for masts and timber. Varieties of Lycopodium, Polypodium, Botrychium, Ophioglossea, Nepenthes, Amomum, Alpinia, Flagellaria, and Casuarina grow on the island. Various kinds of Ferns are mixed up with Gramineæ, Cyperoideæ, and Junceæ. On the exposed red ground are found Santalum myrtifolium, Myrtus communis, Convolvolaceæ and other creeping plants, the Sapindus saponaria, Chiococca augustifolia, Caprifoliaceæ, Citrus, Psydium pyriferum, and on the beach, thick clusters of Rhizophores.

On Gebi are found pigs, several marsupials, crocodiles, parrots, doves, snipes, &c. Numbers of flying-foxes take up their residence on Fow, where they are sometimes so thick as to make the trees from which they suspend themselves appear quite black. Among the beetles are Scarabei, Lucani, Curculiones, Buprestes, Cerambices, all with shining colours. The bay abounds with fish, if we may judge from the numbers that were constantly springing above the surface of the water.

During the few days of our stay, the temperature was 78° at 5 a. m., 88° to 90° from 9 a. m. to 2 p. m., in the afternoon 84° and from 7 to 10 p.m. 85° *Fahrenheit.*

The principal maladies are intermittent fevers, dysentry, opthalmia, leprosy and other cutaneous diseases. Syphilitic complaints are unknown.

We filled up our fresh water from a small brook on the shore of Gebi, bearing north from Fow Island, which proved very good. At high water a boat can approach close to the mouth, but at low tide the reefs oblige the boat to remain at some distance.

Gebi extends N.W. and S.E. and when seen from the westward, appears to consist of two islands. It is hilly, and higher to the south than to the north. The greatest elevation is about 500 feet.

The two kora-koras under Captain Amir which left Ternate before us, joined company here, the others, with one of the princes, having passed to the south by Salawati.

We left Gebi on the 26th March, after receiving on board the son of the Singaji and two other people as pilots and interpreters. On the evening of the same day we passed close to the north of Gagy, and shortly afterwards saw an island towards which we steered, taking it for Piapis (Popo?); but at day-break of the following morning we found ourselves among the Tamean Islands, the northernmost of which being laid down too far south in the charts, had been mistaken for Piapis. This group consists of a multitude of small rocky islets and steep reefs. The N.E. and N.W. islands are moderately elevated. There appeared to be channels among the islands, but as they were unknown we did not see fit to try them, but sought the fair channel to the north.

Dampier Strait, which lies between King William Island and Waigiou to the north, and Batanta and Salawati to the south, affords a good channel for vessels passing from the Moluccas to the Pacific, and is very generally selected. There are two small islands in the entrance, Augusta and Pigeon Islands, which divide the Strait into two channels. That to the north, by King William Island, is difficult, and can only be navigated with a leading wind, when a good look-out is necessary on account of the reefs which extend into the channel from each side. King William Island is high, and terminates to the south in a steep headland. When seen from the eastward, it appears to consist of three separate islands. Augusta and Pigeon Islands are low and covered with vegetation. A reef surrounds them extending about a mile from the shore through which there runs a narrow cut with 30 fathoms water, separating the two islands. An extensive shoal called Vansittart reef stretches from the north side of Batanta, and reduces the channel at one point, opposite Pigeon Island, to a breadth of 1 mile. Mansfield and Foul Islands lie within the reef. There is a bank of sand and coral with 4 fathoms water upon it about 6 miles to the eastward of these islands, which we sought for in vain in the position assigned to it, but when continuing our course we came unexpectedly upon it, and anchored to prevent the vessel being driven into the Strait again on the turn of the tide. On getting under way towards noon on the following day, a small prahu was dispatched to Salawati, to inform the *Hongi*-expedition that we had gone on to Dori.

On the evening of the 29th we passed the islands Amsterdam and Middleburg, near the Cape of Good Hope. They are low, woody, and surrounded by a reef, on which the surf breaks heavily. There is probably good anchorage between these islands and the main. The neighbouring coast of New Guinea is high. Beyond the Cape of Good Hope the hills assume a more decided character, and there is a chain of mountains running parallel to the coast line, and terminating in the Arfak range.

On the 31st of March we entered the Great Bay, passing round Vlakkenhoek (Flat Point) on which there are heavy breakers during the northerly monsoon. We got soundings close under the land, and remained at anchor until the following day, when we tried to enter the harbour, but were unsuccessful. However, on repeating our attempt, we succeeded in reaching the anchorage, where we brought up off the kampong in 10 fathoms water, three quarters of a cables-length from the shore.

Dori Harbour, of which we made a plan during our stay, lies in the N. W. part of the Great Bay, a little to the west of the Flat Point, and is formed by a series of bays running one within the other, the inlet extending in a N.N.W. direction. On the S.E. and S. W. sides it is shut in by the islands Massinama and Nasmapi and by two insulated reefs. The depth, which is very considerable on the east side, where we find 24 fathoms at a distance of less than half a cable's length from the shore, decreases gradually. Both the inner bays contain excellent anchorages, with depths from 20 to 10 fathoms in a sandy bottom. They are perfectly secure. The beach is sandy, encompassed by a very small coral reef. On the outer, or first bay, there is a kampong called Lonfabe, and another on the west side of Massinama.

On our arrival the different chiefs came on board, to hear the commission from the Sultan of Ternate, whose supremacy they acknowledge, which however is not the case with the races to the east of the bay. These chiefs, about ten in number, were dressed in a flowered yellow kabaya, trowsers and headkerchief, which dress they receive from the Sultan in token of their dignity.

The kampong Lonfabe, which is divided into two parts by a tongue of land, the largest lying on the west, is situated on the sea shore under high, beautiful trees. One part contains 20, the other 13 houses, which are raised above the water on posts and have communication with the shore by means of a bridge. They have all the same appearance and are very like an inverted sampan.

The roof is rounded off on both sides with a rafter in the middle which is bent downwards on the side next the sea. The roof here runs out in a point and is rather bent upwards and on this side reaches almost to the floor. On the land side the roof projects straight to a considerable distance from the house and thus forms a kind of gallery, which is the usual sitting place of the women, who here carry on their household work. The men mostly sit on the side next the sea where there is a similar open room.

These houses are of different sizes. Some have a length of 60 to 70 feet and if we further include the outward projecting portions, of about 100 feet. The whole breadth is generally 20 to 25 feet, the height of the roof above the floor 12 to 15 feet. At high water the houses are scarcely above the level of the sea. The exterior walls are of plank, the interior of plank or kajang, the roof of atap resting on transverse rafters. The floors are of rough trunks and branches of trees placed crosswise, resting on other pieces of wood, which are further supported by posts driven into the ground. It requires some practise and circumspection to walk on this weak and undulating surface, where we see the water under us.

Each house is nearly divided into two parts by a passage of the breadth of 10 feet, running through it, and these again are sub-divided into small rooms by partitions of kajang. These are low and dark, for most of them only receive light through the interstices of the floor and the opening into the passage; openings in the outer walls, like windows, are very seldom found.

These apartments are used for sleeping and store-rooms, for the small quantity of household furniture and to cook in. In the middle we generally find a hearth and as the smoke has no other means of escape except through the roof, it remains suspended, makes every thing black, and gives to the whole house a thick smoky atmosphere. In the open room on the side next the sea, there is generally to be found a fire round which the men lie and smoke tobacco. Each house is inhabited by a whole family, so that often 20 men are to be found in the same house, besides the women and children.

The population of New Guinea divides itself into Papuans and Alfuras. The first inhabit the shore, the last the mountains and interior. Both these main classes are divided into different tribes, who are generally in a state of hostility with each other. The Papuans of Dori are of the caste Mytore, derived from the island of that name, which is called Long Island in the English charts, and lies about ten miles to the east of Dori. In general they are short in stature, the most 5¼, very few 5½ feet high, but muscular and well made. Except a single hunchback, we saw no deformed persons, or any particularly stout or lean men. Their colour is dark brown, inclining to black in some. I saw two Albino children here (of the same mother) with white skin, rather passing to yellow, with some brown spots on the back and with white crisped hair and blue or green eyes.

They are generally affected with skin diseases; in some the skin looks as if it were covered with scales (ichthyosis). The hair is black and crisped. It has a reddish-tint at the outer ends, which I think must be ascribed to its being besmeared with lime, or perhaps to its being dried by the great heat.

They usually wear the hair the full length to which it will grow, which makes their head, from a distance, appear twice its actual size. In general they bestow little care upon it, so that it has a disorderly appearance, and gives them a wild aspect. There are some however, whose hair, whether through art or naturally, is smooth and even, as if it had been clipped.

The men wear a comb in their hair, consisting of a piece of bambu having 3 or 4 long points on the under side, like a fork, running into a point above and generally carved. This comb, which is stuck in obliquely at the side, has a small strip of coloured cotton fastened at the top which hangs out like a streamer. The women do not wear this ornament.

The beard is strongly crisped but short. I believe the hairs of the beard are sometimes pulled out. Most Papuans have a high but small forehead ; large dark brown or black eyes ; flat broad noses ; large mouths with thick lips and good teeth ; many, however, have thin crooked noses and thin lips, which give them an European physiognomy. They pierce the ears, and wear some ornaments in them, or their tobacco, which they roll in pandan leaves and of which they are great consumers. The appearance of the Papuans is lazy and stupid ; most of them are very ugly, only a very few have regular features and a lively aspect.

The chiefs dress in the before mentioned kabaya, breeches and headkerchief, which they have some difficulty in fastening on their stiff crisped hair. The rest of the men are wholly naked, with the exception of a chawat, or waist cloth This, which is composed of the bark of a kind of fig tree beat out, is called by them *mar*, and is wrapped round the middle, drawn through between the legs and fastened behind. The women wear a short sarong, generally of blue cotton, which hangs to the knees, or a kind of breeches with very short legs. The body is otherwise entirely uncovered. Some however wear the sarong to above the bosom. The children of both sexes go entirely naked until the age of puberty. All wear rings on the arms composed of fish bones, shells, copper, silver, twisted rattans or rushes. These last, of the breadth of two fingers and usually red coloured, are put on the arm at an early age, and adhere tightly to the skin as the limb grows. The men mostly wear a similar band of rattan on the wrist of the left hand, but much broader and which sits loose on the wrist, in order to prevent the skin being stripped off by the hard string in shooting with the bow. They tatoo themselves on different parts of the body after the death of one of their relations; for instance, on the cheeks and under the eyes after the death of the father; on the breast for the grand father; on the shoulders and arms for the mother and on the back for a brother.

The women also tatoo, but chiefly after the death of one of their female relations. The figures appear to be chosen at will; mostly like those on two crossed klewangs, or two curls running into each other. This tatooing is performed by young girls, by pricking the skin with a fish bone and rubbing in soot. I have seen large scars on some, as if they had been burned. The number of such scars which are to be found on one person (sometimes as many as ten) leads me to suppose that the cause of these has a particular motive, and probably they are used as a means of cure, or perhaps as ornaments.

The inhabitants of Dori are all seafaring. Men, women and children are seen at almost all times in their small outrigger prahus. They prefer making use of their sampans to pass from one house to another to going on foot. They do not walk more than is absolutely necessary, either to go to their gardens, or to bring wood or water, which is the daily duty of the women. They are all very expect in swimming and diving. Often when some of their small prahus were lying near our ship we amused ourselves by throwing overboard pieces of copper, glass beads, and similar trifles. Young and old sprang from the sampans and dived to secure the prize. They scarcely ever came to the surface without having brought up what had been thrown in. Knives were the only things which they did not succeed in securing, as these sank too quickly to allow them to dive for them. The clear water allowed us to follow them with our eyes for a considerable time, and as there were many in the water at the same time, struggles sometimes took place amongst them under water. The children learn to swim and dive as soon as they can run and they can keep in the water a long time.

Most of the prahus have outriggers, and are of different sizes so that some will scarcely carry two boys while others require 20 rowers. They are all hollowed out from the trunk of a tree. The large prahus are used for war and are generally suspended from the rafters of the house. The other small prahus for daily use, are tied to posts under the house, or drawn up on the beach, which can be done by two men, while the children carry their small sampans into and out of the water on their shoulders.

The floats are fastened to the outriggers by pins, so that they can be easily put on or off. With few exceptions the prahus, according to their size, have one or two outriggers on either side, in the last case placed near to or one above the other.

On a pole near the stem they place, chiefly for ornament, a thin, finely carved, red and white striped plank, sometimes furnished with the image of a Papuan's head with out-sticking hair made from gumuti fibres or cassowary feathers.

They use stones for anchors, and twist their cables from long wood fibres or rattans. The sails are of kajang, the mast in the shape of a tripod, two of the feet at the side and one in front as a stay, which mast can be struck when necessary. In the smaller prahus they use paddles of iron-wood or other hard wood; in the large prahus oars with round blades. The large prahus have a hut covered with attap in the middle, and a bow extending a long way out.

On the beach there was a large cargo boat, similar to a tope, but it appeared to me that it did not belong to this place, but had been abandoned as old and useless.

The men chiefly occupy themselves in making prahus, houses and weapons, hunting and fishing, and in a little agriculture, in which they are assisted by the women and children. Early in the morning we noticed them going in a body to the gardens and returning from thence in the evening.

With these people, as with most uncivilized nations, the women do the most and the hardest of the work. They draw water, cut wood, husk the millet and paddy, make pots, weave mats and perform similar domestic work. They are generally seen with a child on their back or a large sack which they support by a broad band round the forehead, a custom which I have remarked as prevailing amongst the Alfuras of Ceram.

Their food consists principally of millet, obi, maize, a little rice, fish, hog's flesh and fruit. Sago, the general food of the inhabitants of the Moluccas and the islands to the east, is here only found in small quantities and is brought from elsewhere. The fish and flesh they eat roasted or dried.

They use their other eatables without salt. Their light nourishment is probably the cause of their not attaining their full strength, for although they are very muscular, they are not in general strong. From this also arises their laziness, which causes them to avoid, as much as possible, all work. They generally lie the whole day round the fire smoking or sleeping, and take very little interest in what is going on around them. When they have any thing inciting them to work, however, they do it with quickness, well, and with a praiseworthy alacrity.

The use of sirih is very general. They are however unacquainted with gambier. Tobacco of a very good quality is grown in the mountains; they roll it in pandan leaves and smoke whenever there is the slightest opportunity. For a very small value, a knife, some strings of beads, a coarse bowl of earthenware, a small piece of copper &c they give a roll of uncut tobacco leaves of some pounds weight. They form their gardens by cutting and burning the light wood and protect them by means of bambu fences against the wild pigs, which according to their account are very numerous, although we could only, notwithstanding many attempts, procure a few small pigs in exchange for knives and cloth. They eat the flesh of the wild pig, but do not keep them in a domestic state, as they are difficult to tame and often wound people. In an Alfura campong, however, further in the interior, pigs were reared. They have no fowls or other feathered animals, on account of the numerous snakes as they alleged; but although our occupations many times required us to go into the jungle and the doctor nearly every day made long journies, we did not perceive the slightest appearance of snakes.

The weapons consist chiefly of bows and arrows, spears, klewangs and parangs, as well as the shield for protection. The bows are formed of bambu or of a kind of very tough red wood; the string rests in two notches near the ends and is made of rattan. The bows which they use in war are 6 or 7 feet long, those for ordinary use are mostly 3 or 4 feet. The arrows are formed of reeds, a little shorter than the bows; they have very long tapering points of bambu, fish bones, pointed bones or wood hardened in the fire; sometimes, but not generally, these points are of iron. Most of the points have sharp barbs, which generally produce incurable wounds, especially in the case of those who have no knowledge of the healing art, and leave the cure to nature. As far as I could learn they do not use poisoned arrows. The points are put into the arrows and fastened with thread, being often subsequently blackened. They generally have a great quantity of arrows in readiness for use.

The spears, like the arrows, have barbed points and are generally 8 to 10 feet long, and frequently have, just below the point, a small bunch of cassowary feathers. The klewangs and parangs, which they make themselves, or purchase from ships, are of the usual form. The shield is of wood, four sided, 5 to 6 feet high, 2 broad, somewhat bent out at the edge and furnished with a handle at the back. They are generally carved on the outside and ornamented with the figure of a Papuan in a sitting posture.

Their mode of making war is by plundering expeditions, in which they burn the houses, lay waste the gardens and seize the women and children, in order to hold them to ransom, or to use them as slaves.

When they make war they generally go in pairs, the first carries the shield and the spear, the one behind the bow and arms. Thus they lie in wait for the enemy behind a tree or rock, fall on him unawares and cut his head off, which is brought back in triumph to the kampong, where a feast is made. The head is hung up in the house of the conqueror as a trophy. I saw five such heads hanging in a row in one of the houses.

Nearly all the different tribes are at feud with each other. If the population of a kampong consider themselves aggrieved, they go out, conquer as much as they can, and then return. Thus a feud is begun, which sometimes lasts for years and is handed down from father to son, since the enemy does not fail to exact vengeance. So it goes on until one of the parties is overcome or makes submission, when the dispute is generally settled by the payment of a fine. They have a great dread of fire arms, but not, according to their account, when they go out against each other. During our stay we were several times cautioned not to go too far into the jungle, nor to the foot of the Arfak, where we could be easily surprised and wounded. Their warlike costume consists in giving themselves a dark appearance, putting on a collar of cassowary feathers and sticking white feathers in their hair.

In fishing they make use of bows and arrows or a spear with two points, generally of iron, which they project loose from the hand or with a long line. They also have a sort of basket, the mouth of which consists of rattans bound together with the points inward, the elasticity allowing the fish to enter but preventing their egress. They likewise use lines and hooks, although not very generally on account of the scarcity of fish hooks.

Their household gear is very scanty and consists merely of some sleeping mats, which they sometimes work very fine and give a very beautiful appearance to by the use of bright colored kajang; further of some earthen pots which they manufacture themselves; a husking block for maize and paddy generally a little cut on the outside; some fishing and hunting tackle; baskets and bags for carrying wood and fruit: knives and parangs; boxes of pandan leaves or rushes, plaited and ornamentally coloured. Their pillows consist of a circularly cut piece of wood resting on a carved foot of the length of 1 or 2 feet and of the height of about half a foot.

The government is parcelled out amongst different chiefs. These are appointed by the Sultan and are called raja, singaji, major, capitein, capitein-lawut and so forth. Their power over the population is very limited, and they do not appear to be bound to obey, if the command does not proceed from the Sultan or from the Singaji of Gebi.

They cannot impose any punishment and do not receive taxes, so that their dignity merely exists in name. When one of the principal chiefs dies, information of the event is conveyed to the Sultan by one of the relatives, who at the same time takes with him a present of slaves and birds of paradise, as a token of fealty. This person is generally named as the successor of the deceased and is presented with a yellow kabaya, breeches and headkerchief. He is then bound to pay a yearly tax to the Sultan of a slave, and to reinforce the *hongi* with three vessels and to furnish it with provisions.

The arts and sciences are of course at a very low scale of cultivation amongst these uncivilized people. Reading and writing are wholly unknown to them, and they have nothing in lieu of these arts. They understand the art of smelting iron. In some houses I saw bars of iron and smiths-bellows, as well as some parangs, klewangs, and points of fish spears, which they had made themselves and which, however rude, appeared to be well fitted for use. They however give the preference to articles manufactured elsewhere and brought by vessels. The bellows is like that of natives elsewhere and consists of two hollow pieces of bambu with suckers of feathers.

Their prahus and weapons are the articles which they make best, as they are strong and well wrought. The carved work with which they ornament many articles is often very pretty and executed with much care; it generally consists of a running scroll, and here and there a human figure. The mats and boxes of rushes are sometimes very ornamental. They are acquainted with the art of working in copper and silver, in which they manufacture their ear and other ornaments, bracelets, rings, &c. and give them many different shapes. The silver is derived from the Spanish dollars which they received from the French vessels Astrolabe and Zelée in exchange for bartered articles.

The trade is small and consists principally in tripang, tortoiseshell, massooi bark and mother o'pearl, which they give in barter for blue cotton, sarongs and other cloths, copper-wire, knives, parangs, different kinds of iron-ware and coloured glass beads, the large kind of which are most in demand. Each one trades for himself, and for that purpose they repair in their prahus to islands a long way off, even as far as Timor, from whence a prahu returned during our stay. Most of the articles mentioned above being adapted for the China trade, a cargo might apparently be sent from thence with advantage, and iron wood, which brings a high price in China, could also be procured here, as it grows in abundance. The transport of this wood from the jungles would be the only difficulty. The trade might be easily extended with a little trouble, if the population were encouraged to apply themselves to agriculture, for which the fruitfulness of the ground holds out good promise. As the long time which a vessel must remain in these parts in order to purchase a cargo, swallows up the profits in a great measure, it is mostly prahus and native vessels which come here to trade, as these are much less expensive in their disbursements. The bark Rembang, however, has visited the coast several times and remained for months, as the natives have no quantity of any article in readiness beforehand.

The little which they brought on board consisted of millet, ubi, cocoanuts, some fruits, mats and boxes, tobacco, now and then a pig and on two occasions a Crown Pigeon, which articles they bartered for empty bottles, buttons, earthen pots, coarse earthenware, but especially for knives which they use in their trade with each other and with the people of the interior. At first they were timid and afraid to bring anything on board, but when they observed that we paid for every article, they gradually came more freely and brought many articles. Latterly they supplied us with large quantities of fish, several excellent varieties of which abound on the coast. Fish could be caught in abundance with a net or fishing-stakes. It is difficult to supply ones wants here and it was found quite impossible to give the crew some refreshments, as far too few were brought on board. The vessels which come here are obliged to bring provisions with them sufficient to last during their stay. If more vessels came and the natives were treated well they would probably be induced to cultivate articles of food for sale.

The manners and customs of the inhabitants of Dori are much less barbarous than might be expected from these rude uncivilized races. On the contrary, in general they give evidence of a mild disposition, of an inclination to right and justice, and strong moral principles. Theft is considered by them as a very grave offence and is of very rare occurrence. They have no fastenings to their houses, and yet the chiefs assured us that seldom or never was anything stolen. Although they were on board our ship or alongside the whole day we never missed anything. Yet they are distrustful of strangers, until they become acquainted with them, as we experienced. This is probably however less a trait of their character than the result of intercourse with strangers, who perhaps have frequently tried to cheat them. The men it is true came on board from the time of our arrival, but were very cautious in letting any of the things they brought for sale out of their hands. The women were very fearful and fled on all sides whenever they saw us, leaving behind what they might be carrying, but at length when they found that they had no injury to dread from us, they became more familiar. In the end they even came to us, but still remained timid. The children very soon became accustomed to us and followed us everywhere.

Respect for the aged, love for their children, fidelity to their wives are traits which reflect honor on their disposition. Chastity is held in high regard and is a virtue which is seldom transgressed by them. A man can only have one wife and is bound to her for life. Concubinage is not permitted. Adultery is unknown amongst them. They are generally very fond of strong drink, but although they go to excess in this, I could not learn that they prepared any fermented liquor, not even sago-weer or tuak. Kidnapping is general in these countries and is followed as a branch of trade, so that there is no dishonour attached to it. The captives are treated well, exchanged, if there are any of theirs in the enemy's hands, or released on payment of a ransom, in the same manner as was done in Europe in the middle ages. It is an inveterate evil, which however might probably be rooted out, were an establishment formed, which would check them in this.

The slave trade is very extended. The price of a slave is reckoned at 25 to 30 guilders. These men are gently treated and are seldom misused, at least I knew nothing to the contrary during our stay. The New Guinea people are very superstitious, most of them being furnished with amulets, consisting of carved pieces of wood, bone or similar articles, which they wear round the neck as protection against disease and the arrows of the enemy.

Their religion consists in the worship and consultation of a wooden image called *karwar*, which each makes for himself and which is considered as the protector of the owner. This image, of the height of a foot or a foot and a half, rudely cut in a human form, stands behind a carved shield which it holds in one hand. The head is unusually large, the nose long and sharp at the point, the mouth wide and furnished with many teeth and the whole body disproportioned in the different parts. It is sometimes hung with a piece of old coloured cotton.

It surprised me that while they gave to all the human figures on their prahus, shields, houses, &c. the appearance of a Papuan with bushy hair, they did not do so to the images of their deities, for I did not see any except with the head smooth or covered with a kerchief. When worshipping they place the image before them, sit down, raise the hands together to the forehead, bow themselves before the image and relate what they intend to do, at the same time asking its advice. If a shivering or perturbation or any other unfavorable sign now seizes them, they believe that their purpose is disapproved of, and postpone its execution until a subsequent opportunity. If nothing extraordinary happens, then they consider it as an approval. On occasion of births, marriages or deaths, the *karwar* must be present as witness.

Besides these private idols, they also appear to have others, who perhaps have rather cognizance of property than persons. Thus wooden figures of alligators, lizards, snakes &c are suspended on some houses, or the pillars on which the houses are built are carved with them. They have no priests, but only soothsayers, who judge according to presages, and are consulted on every important occasion. These presages are of various kinds. For instance, they rub the hand with lime, chew a pinang nut finely, and allow one drop of the spittle to fall upon the hand; if it spots, the presage is favorable; if it does not, then it is a bad sign. The cutting through of a pinang, is favorable or unfavorable, according as the cut is uneven or smooth. They also measure the length of the arm by means of the right hand, spanning with the thumb and the centre finger over the shoulder to the mouth. Then they go downwards in the same manner, but make use of the thumb and the fore-finger. If these two measurements agree exactly, or if the last is shortest, then it is a good sign; if the contrary, it is a bad sign. When about to make war, the male population of the kampong is subjected to a trial of this kind; if the result is unfavorable, then these men are bound to remain behind, but if the contrary, they must go whether willing or not.

The chiefs, as above noticed, cannot inflict punishments. However, if a crime has been committed, the oldest men determine what punishment is suitable. This is then inflicted on the criminal by the population. Generally speaking the punishments are mild and just, as the following will serve to show. An incendiary, with his family, becomes the slave of the proprietor of the house. A person who wilfully wounds another, must give him a slave as compensation. A thief is compelled to make restitution of the property stolen, with something more. On the destruction of a garden, the damages must be made good. An adulterer is persecuted to death, or until he has satisfied the offended party by a heavy fine. A man who forces a girl, must marry her, and has to pay the usual dowry of 10 slaves. In case of adultery the female is not punished and no infamy attaches to the girl.

When a man wishes to marry, he informs the parents of the girl of his inclination, and in case of approval he must pay a dowry of the value of 10 slaves, each slave being calculated at the rate of 5 or 6 pieces of blue cloth, valued at 3 guilders each. This dowry must be paid in every instance; whether the girl is young or old, fair or ugly; but it is not always exacted by the parents. Perhaps this custom has been introduced to prevent all jealousy.

The dowry, or at least a part of it, having been paid, the future consorts meet in presence of the parents, and sit down close to each other in front of the *karwar*, after which the woman gives the man a little tobacco, and he offers her some sirih. They then join their right hands and the marriage is complete, and cannot be dissolved except by death. A chief is not bound to marry the daughter of another chief, but he may choose any girl for his wife, no matter what her lineage may be. This custom leads me to suppose that there is no distinction by birth amongst them.

If a woman becomes a widow, she passes to the brother or to the family of her husband, who receive the dowry if she marries again. If the deceased leaves no relations, then the woman becomes her own inheritor, and returns to her own family.

If a woman is about to be confined, she remains at home so as to be able to obtain immediate assistance. When her labour commences some women come to assist her, and make her sit down in front of the idol. Two of these keep her arms fast, while a third, standing behind her, pours cold water on her head, which is persevered in until the child is born. This strange practice seldom causes any hurt to the mother or child. Immediately after birth, the navelstring is untied, and cut with a piece of sharp bambu. The mother and child are then bathed, rubbed with herbs, and the mother is given some food. The women thereafter meet at a festival. The lying-in woman is placed before a fire to assist her recovery. The child is not named until it is older, when the father gives it the names which it is to bear thereafter.

Upon the death of a great chief, the people meet at the house of the deceased. The body is bathed, enveloped in white cotton, and carried to the grave. The grave is made to a depth of five feet, and the *karwar* is produced, and being considered as the cause of the death, is covered with reproaches. The body, resting with the ear on a porcelain cup or dish, is then deposited in the grave.

Some weapons and ornaments are put into the grave, which is closed, covered with a roof of attap and surrounded with a hedge. The idol is placed on the grave, and remains there until destroyed by time. After the burial, the people return to the house of the deceased and partake of a dinner, to which every one contributes his share. During one month they must come and lament the deceased at his house. All these ceremonies are not followed at the burial of an inferior person, but it is conducted in a similar manner.

Tatooing with them appears to be a sign of mourning or of remembrance of deceased relations, for they place it on different parts of the body, according to the degree in which they stood with the deceased, as already mentioned.

From their simple manner of living, few severe diseases are known to these people. The chief are diseases of the organs of respiration, dysentery, slight fevers, elephantiais and many other skin diseases, especially ichthyosis. Amongst strangers beri-beri is met with from time to time. Small pox and syphilis are not known here. The medicines are very simple, and for the most part consist in herbs and barks of trees, which they use internally and externally. They have no idea of surgery, and leave the cure of wounds wholly to nature.

The country in which the kampong is situated, as well as the Islands Massinama and Nosmapi, belong to the tertiary formation. The soil consists of madrepore lime, with a covering of waterclay and loam. In the centre runs a chain of mountains with branches on the south side, from whence some brooks flow towards the sea. One of these brooks has its outlets near the kampong. After long rains the water is good, but from the slight fall of the ground it gets brackish in droughts, the sea water mixing with it at high water mark. A little higher up, the water is clean and has a good taste, but the population use well water. A little to the east of the kampong another small brook is found, which has excellent water and runs into the sea. We derived our supply from this hook.

The Flora of these countries is rich in Filices, Scitamineæ, Aroideæ with edible roots, Convolvolacea and Solanaceæ. The Gramineæ furnish Saccharum, Milium, Oryza, Zea, the beautiful

Phalaris arundinacea. Amongst the fruit trees were seen Carica papaya, Musa paradisiaca,, Bromelia, Ananas, Citrus aurantium in great quantity, Canarium commune, Terminalia katapan and Myristica moschata. Along the shore there are Rhizophora, Myrobalanus, Mangium, Avicennia, Barringtonia, Elæocarpus, Xanthoxylum, Celastrineæ, Ficus, Ricinus, Artocarpus, Calamus, Flagellaria, Bambusa, Acacia, and Casuarina.

More than 150 kinds of insects were collected, amongst which may be mentioned Scarabei, Buprestides, Curculionides, and also beautiful Lepidopteres and Hemipteres. This country is also rich in beautiful coloured Arachnides.

Amongst the birds there are found Psittacus galeritus, Phlyctolaphus sulphureus, Psittacus aterrimus and species of Buceros. Of the Birds of Paradise various kinds were collected; viz. the brown feathered with beautiful white and orange coloured feathers on the sides; the wholly black with long tail and large bent beak; a small yellow kind with orange coloured breast; another kind, red, with two pens projecting from the tail, with a small green coloured, curled bunch of feathers at the ends.

The mammiferous animals are few in number. We only saw some wild hogs, and a speces of marsupial, Perameles doryanus, about the size of a rat, with scanty reddish hair like bristles, an extended pointed snout, short tail, and a pocket on the belly in which it carries its young ones.

Of the Islands Massanama and Nosmapi the first only is inhabited. A considerable kampong is situated on the west side on a sandy beach. The island is very well cultivated. In the centre there are large plains with Arum esculentum, rice, indian corn, maize and other cereals. The rest of the vegetation consists of forests of Citrus aurantium, canes, brush plants, creepers and high trees of Artocarpus and Ficus.

During the time of our stay, from 1st to 22nd April, the wind for the most part was S. E. and N. E. which towards evening was often alternated by N. W. seldom by S. W. winds. In the evening there was usually lightning in the S. W. and S. E. but without thunder; the weather was in general fair with occasionally slight showers.

The mean temperature in the morning at 6 o'clock was 78°, at 9 o'clock 88° to 90°, at 6 o'clock in the evening 84°, at 10 o'clock 80° F.; the highest on the 1st April at 9 o'clock 96°, the lowest on the 22nd April at 5 o'clock in the morning 76°.

If a settlement is ever established on the north coast of New Guinea, Dori ought certainly to be first taken into consideration. The advantageous situation on several bays of good depth, where ships can lie securely at all times, entering easily with all winds through clear and deep channels;—the abundance of good fresh water; the fertility of the soil; the nature of the country, slightly mountainous without marshes or pools; the small trouble it would cost to render a large plain fit for cultivation, for the ground slopes gradually from the foot of the hilly chain to the coast, with high trees, standing wide apart, between which low creepers only are found, which could be removed without much trouble; the salubrity of the climate, which would be improved as soon as a more free circulation of air was promoted by the removal of the brush-wood; the gentle disposition of the population; the articles of trade, so well adapted for the China market; the vicinity of different islands in the great bay, and of the W. coast on the other side of the small peninsula to the East of Maccluer's gulf, are sufficient reasons for making choice of this place.

The island Massinama, about one (Dutch) mile long and half a mile in breadth, offers nearly the same advantages as the mainland, from which it is separated by a channel of only half a mile in breadth, but there is no suitable anchorage in its immediate vicinity. Building materials are found here in abundance, and also clay to make bricks, fine coral to burn for lime, and different kinds of mast and timber wood. It is well adapted for the cultivation of rice, and if cattle and poultry were introduced they would no doubt thrive. An establishment here would therefore probably be productive of favourable results, and would assuredly be more salubrious than many newly cleared places within the tropics. Europeans of course would have to avoid heavy personal fatigue. The natives, Javanese or Malays, should employed for such purposes. From the gentle and even timorous character of the natives, assistance rather than obstacles might be expected from them, and they would soon attach themselves to the colonists if these only treated them kindly and protected them against the piratical visits of the *hongi*.

The long expected fleet arrived on the morning of the 20th April. It consisted of 8 vessels, amongst which were two large korra-korras. Ranged one behind the other, they approached in short tacks, pulling to the sound of the tifa and gong, ornamented with standards, pendants, ensigns and flags, as well the Dutch, as also that of the company, and the native colours of Tidore, Salawati and Wagio.

The two last named flags hang like standards, the square head-part between two rods, which are furnished with brass knobs, while the inferior part runs into a point, hangs loosely, and is striped horizontaly blue and white; the square block is blue, and has a round white figure in its centre. From the poop and the stern, small three cornered flags were hanging in a vertical position with the colors of the country, red with white borders for Tidore, blue for Salawati. On their arrival at the kampong they moored the prahus to the houses.

The fleet had left Salawati on the 1st April, precisely at the time the east wind commenced to blow steadily. Having with great difficulty reached Amsterdam and Middelburg, a prahu was knocked to pieces by the high sea, but the crew were saved by the other vessels. On account of heavy seas and strong winds the fleet had been compelled twice to keep off, so that it only reached Dori on the 20th.

On the news of the arrival of the *hongi* fleet, the women and children took to flight with the small canoes, carrying with them everything of the least value. They went to the interior bays and the opposite side, in order to avoid the rapacity of the crews of the *hongi*. The chief at once went to Captain Amir, and took with him, as a token of his submission, a great number of birds of paradise and a slave for a present.

It is not to be wondered at that the *hongi* instil so much fear everywhere, for wherever they come, the crews pillage and steal as much as they can; they destroy the plantations and appropriate to themselves all they choose. It is through means of the *hongi* voyages that the Sultan maintains his power, for on failure of obedience or negligence in the execution of orders, such a fleet is sent to murder or to make prisoners of the population, to destroy the kampongs, and thus to punish all in a severe manner. A specimen of this has already been mentioned when speaking of Gebi, which was reduced by such a fleet. Last year a fleet was sent by the Sultan to bring under subjection the countries situated to the east of the Great bay, but when the crews were on shore near the Arimoa islands, they were attacked and compelled to return, with the loss of six dead and many wounded.

One of the objects of our voyage was to erect at different points of the coast iron plates with the royal arms and the inscription " Netherlands India," which plates had been cast at Surabaya for that purpose.

A pillar was erected on a small height, below old katappan trees, on the left bank of the rivulet which flows into the sea near the kampong. By our observation its position was fixed in 0° 52' 20" S. Latitude, and 134° 5' Longitude E. of Greenwich.

The people were present and assisted at the erection of the pillar, and learnt with joy that it was a sign that the Netherlands Government took the place under its protection, for they hoped that through this they would be exempted from the visits of the *hongi*. The chief was directed to keep the pillar in good condition, and in order to inspire the population with reverence for it, they were informed that it was an amulet for the kampong, which caused great satisfaction.

The first plan for the voyage was to wait for the *hongi* fleet until the 22nd April, and if it had not then arrived, to proceed to Bougainville bay, because it was anticipated that this voyage would be more difficult in proportion to the advanced state of the monsoon. This plan was altered on the arrival of the *hongi* vessels, for Captain Amîr and the Singaji of Gebi, an old experienced seaman, who appeared to have a good knowledge of these waters, most positively asserted that the wind would blow more from the south and more steadily in proportion to the advance of the season. It was therefore resolved to go first towards the island Run, in the south part of the bay, and from thence to work towards Bougainville bay.

On the morning of the 25th April we left Dori, but could not work through the usual channel between the mainland and Massinama on account of light winds and adverse currents. We therefore ran through the channel situated between Ivory reef and the island Nosmapi, which although narrow is deep, having soundings of 5 to 9 fathoms at a stone's throw from the shore.

The two great bays immediately to the south of Dori are spacious and appear to be without dangers, with the exception of a detached reef in the most southern bay about mid channel. There are however no kampongs, although traces of houses are found in the northern bay. This is the reason why none of these bays should be preferred to that of Dori. In looking out for an anchorage we missed the opportunity of examining these more minutely, and as we occupied ourselves chiefly with the two inner bays and with the anchorage, we only made a very cursory examination of the other bays. It appears to me, however, that they are safe and of easy entrance if mid channel is kept, in which case a good depth is found for anchoring.

The Arfak is a high mountain, which forms the eastern termination of the chain which runs from the Cape of Good Hope in an E. direction to the bay, where it takes a S. direction, and abruptly terminates in the sea, so that even at a short distance from the shore no anchorage is found. The Alfura tribes reside on this mountain. The only sign of population which I observed, consisted in a small house, high up the declivity of the mountain, of the square form of the Javanese huts. From the great distance it was scarcely to be made out, but it appeared to me to be built of bambu or gaba-gaba, and to be covered with a roof of atap. Here and there we saw some spots where the wood had been cleared for cultivation and some clouds of smoke rising up.

The generally light westerly winds rendered our course tedious. In the evening of the 26th we passed Arfa, a low islet to the east of the point of Amberpua, also the Mysore Islands, consisting of two separate groups, of which the northern is composed of 5 small and low islands and the other of 4 rather high islands. The most southern of all has the form of a wedge. With the dawn of day of the 27th we found ourselves in the vicinity of Run.

This island, or rather this group of small islands, consists for the most part of high rocky ground. Some of the cliffs lying close to it are completely bare, others are only covered with vegetation at the top. Below the green, the rocks are seen like a wall, and being surrounded by a reef, which is uncovered at low water mark, the whole is like a basket with flowers. The principal island has the form of a right angle, of which the eastern branch runs north and south, the southern east and west, forming a kind of bay, in which two large and some small islands are situated. One of these last is perforated so that it looks like a door. There are channels, between the different islands, which, however, ought to be used with much caution on account of some reefs, amongst others a small detached reef which lies between the two small islands, and another which extends for about one and a half cable's length from the east point of the most southern.

At half past 5 o'clock in the evening, we came to an anchor near the kampong Run. This anchorage is not to be recommended to ships. It consists in a small indentation of the reef which surrounds the shore, and extends on the east side in the form of a horn. The depth in this basin is considerable, for we lay in the centre at half a cable's length from the reef and at about one from the shore, in 22 fathoms. We moored here, and carried an anchor to the reef, to prevent us from driving, a precaution which is strongly to be recommended to ships which visit this place. The great and rapidly increasing depth, and the small space, would make this place dangerous, if the surrounding high land did not prevent any high sea, and few strong winds are to be expected. We found two prahus here from Ternate, which after a stay of three months had taken in a cargo of tripang, tortoiseshell and massoi bark, to a value of about 3,000 guilders, and left two days after our arrival. We made use of this favorable opportunity to forward a mail to Ternate. A schooner, also from Ternate, was lying at Amberpua, a place in Van Dammen bay, at the distance of a few miles from Run. Ships very seldom visit this island. The barque Rembang, Captain Deighton, had however been here 4 times. Captain Deighton was known to all the inhabitants. They frequently spoke of him with love and affection. To his honorable conduct and amiable character is perhaps to be ascribed, that we did not observe in these men anything of the fear and suspicion which were so visible at Dori, where the population had been repeatedly in contact with Europeans. Men, women, and children surrounded us from the beginning, and assisted us whenever they could. The view of the land from the anchorage is grand and beautiful. A very steep chain of mountains, five to six hundred feet high, everywhere covered with vegetation, here and there with inclosed spots for gardens, at others with naked perpendicular walls of rock, extends the whole-length of the island. At the foot there is a broad white sandy beach, covered at high water, on which the kampong is built. On the side next the sea are the islands already mentioned, for the most part all high, of singular forms, and reflected with their verdant slopes in the smooth water. In the distance the coast of Van Dammen and the island Muismar.

The kampong consists of 8 houses in the Papuan form already described, and of another with a high square roof. Other three houses stand a little to the east, below a group of cocoanut trees, separated from the chief kampong by a peninsula which hides them from the anchorage. At low water the houses may be approached dry-shod, for they have not, as at Dori, communication with the shore by means of a bridge; but the water having a rise of 5 to 6 feet, they cannot be approached at high water otherwise than in prahus. A little to the west of the kampong a stream falls from the rocks, and close to the shore forms a cascade 15 or 20 feet in height, with a bason 4 feet deep, which makes an excellent watering and bathing place Above this waterfall the same rivulet forms three other cascades, one above the other, which descend from the top of the island. Except at very low water, a boat can always lie close to the waterfall, and a ship can therefore be supplied in a very short time with abundance of excellent, clear water. The water of this rivulet is conducted in bambu pipes to the kampong, as well for the daily supply of drinking water, as for washing the sago. On the other side another small rivulet is found. The gardens are mostly formed on the other islands, which, as has already been mentioned, are situated in the immediate vicinity and are better adapted for the purpose. During the whole day small prahus are seen passing and repassing, which much enlivens the landscape.

The rocks consist of shale with veins of quartz and layers of glimmerschiefer, mostly covered with a layer of waterclay and pipeclay. The shore was strewn with large pieces of rock, which had fallen down, and of which many were broken into regular blocks. The reef, which encircles the sandy beach on the seaside, is not broad, but produces the most beautiful corals.

The flora is distinguished by Laurineas and Myrtacias on the high ground, as well as many kinds of palm trees, amongst which the sago palm was very abundant, which furnishes the inhabitants with their principal food. I saw here some species of fig with good fruit, and a tree with a dark blue fruit of a faint sweet taste, oval, as big as the mango, with a large kernel and smooth rind. Ferns are found here and there of the height of 15 feet, with a trunk which could scarcely be encircled with both hands.

A male Phalangista maculata was brought to us for sale, but I do not know whether it was procured on the island, or from the mainland. This animal, as big as a cat, has a long snout, large, round, protuberant eyes; yellow and brown spotted skin; long tail, covered with hair on the upper part, but bare on the lower part and at the end. With its tail it fastens itself in climbing, and rolls it up when running. A female, which we got afterwards, had a yellow skin, with long soft hairs, but without spots, and had a pocket under the belly, formed by a fold in the hide, into which the hand could be inserted. As is well known, she carries her young ones in it, hanging on the nipples, until they have grown strong enough to leave this shelter. A bird like a swallow, with a large broad beak split to below the eyes, was also brought to us. It had red eyes, a long tail, weak feet without claws, brown feathers, and some small pens round the nostrils.

The inhabitants have generally an agreeable appearance, with crisped hair not of unusual length. The men, like those at Dori, wear a chawat, but it is made from the plantain and not of the bark of the fig tree. The front part is fastened to a belt of colored rattan, which repeatedly encircles the waist, is then drawn between the legs and is only slightly fastened from behind, thus forming a very imperfect covering. The women generally wear a piece of blue cotton, which hangs in front and behind in large folds, and is fastened by a belt of red and yellow coloured rattan, wrapped round the waist ten or twelve times. The leg and the side therefore remain uncovered.

Both sexes tatoo themselves on different parts of the body, and wear rings of shells, brass, hogs teeth or twisted rattans round their arms, wrists, and over the shoulders. In the ears they wear strings of beads or flowers, or rings made of a blue stone in the form of a horse-shoe. Round the neck the women and children wear strings of beads, to which they generally suspend a white shell. The men also wear these, but less generally, and not in such great quantities. The favorite colour appears to be white which is little esteemed at Dori. On the death of one of their nearest relations, the women, for one year, wear a coarse sack over the head in the form of a monk's hood, which also covers a great part of the back.

One evening when we came on shore, all the children of the kampong were collected together and beads thrown amongst them Not only the children, but women, men, and even some of the chiefs of the *hongi*-vessels attacked the beads, and ran from every quarter to obtain a share of them. All were on their knees on the sand and shewed how much they prized these presents, by the zeal and attention with which they sought for them and by their shouts and merry laughter whenever they were in luck. Although these toys are of great value to them, the search was conducted with perfect order and regularity, without the fights which in civilised Europe would be the consequence of the unequal distribution of ornaments.

Walking along the beach after this distribution, I entered into conversation with a native, who spoke a little Malay, and who invited me to his house, where I was led into the room which served as a dwelling place for his family. I thought that all the women would take to flight and was not a little astonished to find that they sat down close to me, and observed me with attention, but without troublesome intrusion. Thus I sat there, in the midst of six women, amongst whom were three young girls, who on account of their beautiful eyes, clear, white, regular teeth, happy laughing appearance, round shoulders and arms, fine hands, beautiful breasts, and well formed limbs, deserved the name of beautiful, not only in the eyes of the Papuan, but also in those of the European. The frankness with which I was received struck me, not having expected it at all. They brought me a dish of papeda, some roasted fish, yams and fruit, requesting me to partake of it, which I did to please them. Seeing a ring on my finger, one of the girls took my hand to try to draw off the ring to examine it, but not succeeding, I took it off and handed it to her. After examination it was returned to me with care. I mention this, because the familiarity with which I was treated astonished me, and gave me a very favorable idea of these people.

The furniture was generally the same as at Dori, and consisted in some pots and cups of earthenware, the same kind of cushions, but smaller, a Javanese wooden chest, wooden dishes, a husking block, baskets, hampers and mats, a tifa carved externally, arrows, bows, and lances, and some fishing apparatus. In the verandah a sampan was hanging, 30 feet in length, about 3 feet high, and 3 to 4 feet broad, cut out from the trunk of a single tree, but in which 20 warriors could easily sit. I saw a similar prahu coming from the neighbouring coast, flying over the still water to the sound of the tifa and the song of twenty pullers. The outriggers were in two rows, one above the other, supported by twelve beams. By means of these they lie so secure on the water as to make it impossible to capsize them, not even if one of the outriggers were to be knocked off. In the centre is a separate space, covered with kajang, for the use of the chief.

A square sail of kajang is carried on a mast placed in the front part of the vessel. In the stern the prahu is solid wood. Here sits the helms-man, who steers the vessel with a broad paddle. With proud satisfaction my conductor showed me a strong, small and pointed knife, with which he had killed his enemy by a single stroke. It had been manufactured by himself, had a handle of bone, and looked like a dirk. A red cotton handkerchief, which I gave to one of the women, appeared to afford her very great pleasure. I would also willingly have given something to the others, in token of gratitude for their entertainment, but having nothing else with me, I was unable to do so,—this, however, did not appear to create any jealousy.

After having remained sitting for some time, I took my leave, when some fruit was offered to me.

The language, although not the same as that of Dori, appears to have much similarity to it. It is melodious and soft, with only a few hard sounds. We could not, from our short sojourn amongst them, observe much of their manners and customs, but it is said that they are nearly similar in the whole bay, and that they differ merely in trifles. This, however, applies only to the inhabitants of the islands and coast. The tribes in the interior present greater dissimilarities. For instance the inhabitants of the coast Van Dammen, eat the dead bodies instead of burying them. Thus the husband eats the dead body of his wife; and she eats that of her husband, with the help of the other members of the family.

Amongst the diseases to which the population is liable, beri-beri, which is apt to degenerate into a total lameness of the limbs, deserves notice.

We erected one of the pillars we had brought with us at the foot of the water-fall, where Captain Deighton had planted some cocoanut trees and built a house, of which however nothing remained. As at Dori, a pedestal of masonry was built round it by the *hongi*. These vessels arrived together with us, and were drawn up on the beach or moored to the houses. On this account the natives reckoned this anchorage a very good one. It appears to me that an anchorage for ships might be found in the bay, but we wanted time and opportunity to examine it. The vessels of the *hongi* contributed not a little to animate and exhilarate the scene. The prahus were cleaned, for which there had been no opportunity at Dori. Most of the crews were busy, under the beautiful high trees along the beach, with the repair of one article or another, chopping wood, forging iron, coopering barrels, cooking victuals, or sat or lay together. Here also the inhabitants, notwithstanding their mild character, were pillaged. A woman came complaining that her garden had been destroyed, for which she received some compensation in cloth and brass-wire, which satisfied her very well. We could not discover the guilty party. These men appeared to consider that they had a right to pillage, for the presence of a Dutch man-of-war did not prevent it. As their only excuse, it may be said that they are compelled to participate in these voyages without any remuneration, and that it is difficult for them to carry victuals for a length of time, so that they must procure them where and how they can.

The position of the pillar was fixed by observation to be in 2° 21' South Latitude and 134° 38' East Longitude.

In some charts it is mentioned that a passage to the west shore exists in the south of the bay. It appeared to us, on making enquiries, that this was not the case, and that a strip of land some miles in breadth, over which the chain of mountains runs, separated the two seas. There are many small islands in the south part of the bay, partly inhabited, which, together with the numerous reefs, make the navigation difficult.

The coast on the east of the bay is thickly inhabited. A great number of kampongs are scattered about. This side has the advantage of affording good anchorage everywhere. The beaches are also much more level and lower than those of the west coast. Many rivers here flow into the sea, and by the mud they carry with them, have rendered the sea shallower, and extended the land. The ship Geelvink circumnavigated the bay in 1705, procured water in the south part, and gave it the name of Geelvink's bay, which name however was afterwards transferred to a small bay to the west of the point of Amberbaken, while the first is more generally called Great or Van Dammen's Bay; this last name being derived from the extensive country to the west.

On the 1st May we left this place at the dawn of day, after a stay of only three days, and ran along the side of a detached reef, mid-channel between the two largest islands in the bay, on which there appeared to be only 3 or 4 fathoms water. Remaining on it only a very short time, there was no time to heave the lead. For caution's sake it ought to be avoided. Although the channel along the east coast presents many advantages, it was not advisable to take this route, for we would have had to sail in the centre of reefs during the night; we therefore took the channel which we had followed in going to Run, viz: between the island Muismar and the group of Mysore, and afterwards round the North of the latter. Calms and contrary currents, however, prevented us from advancing rapidly. While we were becalmed near the island Misnum, a little to the west of Jobi, the *hongi* vessels passed us. Captain Amir was informed that we should go first to Ansus, as it lay in our way, and must be passed at a short distance.

The south coast of Jobi is high, with various bays, some of which extend deep into the land. It is said that in the S. W. part a good anchorage is to be found in Anna bay where a ship lies shut in on all sides, secure against wind and sea. Islands are scattered about along and generally close to the whole south coast. A group of high islands lies about the centre, a little more towards the sea. The largest of these, called Ansus, is high and the tops of two mountains are visible at a distance of 8 (Dutch) miles, which, when seen from the west, give it the appearance of two separate islands. A little more to the south there are three smaller islands called the Evening Islands in the small chart of the Rembang.

We arrived in the vicinity of the Island Ansus at sunset on the evening of the 6th. Being totally unacquainted with the place, it was not advisable to run in during the night, and we therefore intended to keep at sea, sending a boat next morning to search for a proper anchorage. Sounding in going about, we unexpectedly found 13 fathoms, which we had not anticipated on account of the steep beach. Here we came to an anchor. It was most fortunate that we had not penetrated further; for the next morning a reef was discovered at a small distance, with 2½ fathoms of water, directly in the course we were following. A great number of small prahus came to sell fish, which are harpooned or caught in nets. The nets have the form of links with light wooden blocks at the higher part and white shells at the lower part. The nets are knotted in the same manner as in Europe, of thread which is obtained from sea plants or from the bark of trees. Each prahu had a net, in some instances very long.

The great number of islands along the shore, form narrow and winding but deep channels, surrounded by steep extensive reefs with only a little water on them, while there are 20 to 25 fathoms generally in the centre. It is not advisable for a ship which wishes to enter, to sail straight through unless with the greatest care, and putting down beacons. With these precautions we may approach close to the kampong.

Mr Deighton has been here repeatedly, and anchored within the first point, where there is a small sandy beach, on which he has planted some cocoanut trees.

The beaches are generally high and overgrown with Rhizophora. At some places rocks protrude, and also shales which are undermined at the level of the sea.

The Singaji coming on board, was ordered to send a boat next morning, to land the pillar. We went on shore very early to point out the position where it was to be placed, and were struck by the beautiful view which presented itself to our eyes. The great number of high islands covered with vegetation, behind which the sea was visible here and there; the riches which nature presented in the variety of trees and plants; the high trees with their straight white trunks and broad tops, extending far above the low plants; the different tints of green, with the varied forms of the trees, sometimes sharply defined, sometimes blending in each other; the extensive kampong; the clear blue atmosphere; the broad shadows and white spots; all this reflected in the smooth water as in a mirror; the rich color of the corals of the reefs over which we were passing; the constant change of aspect from the windings of the channels; all formed a most beautiful whole.

The kampong, consisting of about 20 houses, was not visible from our anchorage, being hidden by a point. It was formerly situated on the Island Ansus, but being there exposed to the hostile attacks of the neighbouring tribes, it was removed to the mainland.

The houses, built on posts, are placed entirely in the water. At very low water only is the beach partially uncovered. This beach consists of mud, in which the mangroves grow luxuriantly and completely obstruct a landing. The gardens, from this cause, are situated on the surrounding islands, principally on an island with a high beach lying opposite to the kampong.

The houses are precisely similar to those already described, except that they have no communication with the shore, but on the other hand they have an extended flooring, forming a balcony round the house, from whence entrance is obtained through small square openings in the walls.

The sound of the tifa had apprized us on the preceding evening of the arrival of the *hongi*. The Singaji instead of executing the order given, had gone with the prahus to meet the fleet. On coming to his house, we therefore found that the pillar had not yet been brought on shore. One of the other chiefs was then ordered to see this done, but was only persuaded to do it, after a lengthened consultation, by the promise of some knives. He soon started in a prahu with 16 pullers.

In the meantime we were sitting in the house surrounded by natives, who contemplated us with curiosity. The want of communication by land with the other dwellings obliged us to remain in this one. The dress of the people is exactly similar to that of the inhabitants of Run, both as regards the male and female dress.

The tatooing appears to be less general than at Dori. I however saw some who had their bodies ornamented with it. They appear to make more use of other ornaments, chiefly rings and beads, which they wear in great variety. Some had strings of beads braided in their hair, others wore them round the neck or on the back; one of them had an ornament of beads in the shape of a crescent or moon on the breast, which he wore like a gorget. They wear white shells on the knees, the arms, and also, strung on a rattan, on the back, where they hang down like a queue.

The wearing of amulets is also very general. Some wore two or three close together made of wood or bone, and of a human or other form. The men generally have the nose perforated, and wear in it small pieces of bone, which stick out a little on both sides. Many wear brass or silver rings in the ears, either in the lobe, or in different rows, the one above the other, in the rim of the ear. Round the arms, the wrists, and over the shoulders, they wear bands of plaited rattan, of a bright red and yellow colour, forming various kinds of figures. With the exception of the bands round the wrists of the bowmen, the others appear to me to serve only as ornaments.

The hair is worn in many different fashions; by some long, with the comb of bamboo, by others short; some had it bound up in four bundles, which stuck out like some many points from the front, from behind, and from both sides; others had all the hair bound up, and standing upright in a point on the back of the head; others again wore it smooth on the head, fastened by a single band on the crown, from whence it came out in a tuft, while the hair on the forehead, not contained in the tuft, stood erect, forming a strange but not unbecoming head-dress. The few women whom I saw, wore it in its natural state, without bestowing any care upon it. I saw the hair of one child hanging down, plaited in thin tresses in the Polish fashion.

The appearance of these people is in general good natured, the faces are regular, the eyes beautifully black, the mouth broad with beautiful regular teeth, the forehead high and narrow. Many have thin lips and finely curved noses, which gives them a more European physiognomy. The men are generally handsome and well formed, stout, without being too thick, strong and muscular; the women very good looking; and some children with very regular soft faces, and long pendant curling hair.

The furniture, as in the other places, is scanty and very simple, and in regard to it, as well as the weapons, I did not observed any peculiarities. The paddles of the sampans are generally broader and carved with more care, and the handle mostly in the form of a man. The prahus have generally outriggers on both sides. At ordinary seasons the large war-prahus are suspended from the beams of the houses.

The food consists chiefly of sago, fish and vegetables; pigs and crown pigeons, are bred in a neighbouring Alfura kampong. We had no time to send for some of them; and the only provisions we could procure here were a few fish and some fruit, chiefly cocoanuts and pine-apples. They also offered us some tortoiseshell in exchange for knives and cloth.

They understand the art of making fire by the friction of two pieces of wood. They do this in every prahu, in order to light their cigars.

While we were sitting in this house, the *hongi* vessels, ornamented with their flags, came pulling slowly and in curves towards the kampong. We observed that every thing was packed as quickly as possible and put into the prahus. Anxiety was plainly visible on the faces of the inhabitants, and proved that here also sorrowful experience had been made of the pillage and devastation created on the occasion of such visits. We were now informed that the pillar had been brought on shore, and we lost no time in having it set up. This took place on a sandy beach in the vicinity of the water course, where a rivulet with a small waterfall, 6 feet in height, falls into the sea.

The water is clear, of good taste, and easily procured, for the boats can lie at the foot of the fall. The inhabitants bring their water from this place, although they have to pull a considerable distance for it. On expressing our surprise that the kampong had not been built here, where it would have been situated more advantageously in all respects, Captain Amir, whom we had met and who accompanied us, said:—"I will order them to remove and to reside here"—thus affording a proof of the despotism and unlimited power with which these people are governed by their princes.

We sailed on the morning of the 9th, and found that the bank on which we had been at anchor extended half a mile from the shore, and consisted of fine yellow sand with black spots and broken shells. The westerly current drove us near the place where breakers are marked on the chart, but we did not observe them. Reefs were also marked to the east of the Evening Islands, and a discoloration of the water at that place led me to believe that they actually existed.

A clear channel, with anchorage close to the larger island, is found between the Evening Islands and the south part of Ansus. On account of the light winds and strong northwest current, we advanced slowly, remaining at a distance of 1½ or 2 miles from the coast, which abounds with bays and islands. At the southeast point of Jobi lies the bay of Ambaai, which is said to possess a good anchorage. At day-break of the 11th we were in sight of the low coast on the eastside, and a small low island named Waropin, and the same day we received intelligence that the *hongi* had arrived at Suru, a kampong a little to the west of Ambaai, to take in water. Tacking, we entered the channel which separates Jobi from the mainland, and experienced a northerly current. Running under light sail in mid-channel, we kept the lead going during the night, constantly decreasing from 30 to 11 fathoms sandy bottom, where we came to anchor to wait for day-light, imagining that we must be close to Kurudu, but at dawn we found ourselves still some miles from it. Working towards the island, we found that the shoal extended over the whole breadth of the strait, varying from 5 to 12 fathoms, increasing in the vicinity of Kurudu. The wind having fallen nearly calm, a strong E. N. E. current carried us with irresistible force through the channel between Jobi and Kurudu, where we found no ground with 40 fathoms. An extensive reef to the west of the island on which a heavy surf broke, was completely above water. No sooner, assisted by a slight breeze, had we reached the north of the point, than we found anchorage in 14 fathoms, and much less current.

It appears that this current being stopped by the island, and finding no other outlet than through the narrow straits on both sides, has formed the deep bay; while, from the silting of the rivers on the east side, a shoal has been formed which turns the stream towards the west of the island. We ran at about a ¼ of a mile to the north of the island, finding generally the same depth of 5 to 7 fathoms in proportion to the distance from the coast. A broad reef which surrounds the whole island was entirely dry. Near the east point we saw a heavy surf on a shoal, situated midway between the mainland and Kurudu; but leaving a clear channel along the island. While we were sailing along the coast, many of the inhabitants were standing on the beach looking at us, especially when we sailed round the east point and came to anchor opposite the kampong.

We lay here in 4 fathoms sandy bottom, at 2 or 3 cables' length from the shore. A boat was sent there. The inhabitant awaited her arrival on the beach, all being armed, but without doing any mischief. A small prahu with the chief and three men came alongside, but none of them would come on board. They soon left and returned to the beach. Some presents of beads and handkerchiefs appeared to allay their fears, and caused them to lay their weapons aside, but they followed us closely, offering their assistance, however, as much as was in their power. Observing the doctor collecting shells and flowers, they brought him specimens from all sides, and accompanied him back to the boat. The evening gun which was fired in order to inspire them with respect, appeared to have frightened them to such a degree, that packing up all their goods of value, they departed during the night, and probably went to the opposite shore; the kampong at all events was found deserted next morning, all the small prahus had disappeared, and we observed columns of smoke constantly rising on the mainland. The intelligence of the approach of the *hongi*, perhaps influenced them in their hurried flight. The somewhat inimical deportment which they showed on the approach of the boat, must in my opinion be attributed chiefly to their fear. Probably they had never, or at least very seldom, seen European vessels and white men, and taking us for part of the *hongi* fleet, they may have feared that we came to rob them. I believe that in most cases, where we have to deal with uncivilized nations, it is much better to inspire confidence in them than fear, and to show them that we have no hostile intentions towards them. If we go on shore armed, this shows immediately that we are afraid of them, and that we are on our guard; their suspicion is thus aroused, and they put themselves in a state of self defence. This suspicion is strengthened by the smallest misunderstanding, and weapons are often used without occasion for it. A too great caution, in all probability, has often been the cause why Europeans or others have been murdered by completely or half savage nations, which probably would not have happened, if they had been inspired with more confidence.

The kampong is situated on the N. E. part of the island. There is another kampong, according to the assertion of the pilot, in the south part. The first named covers a considerable space on the beach. The houses are divided into different groups, either on account of the vicinity of the creeks, or owing to the nature of the beach, which is rocky. This place must have been much more populous formerly, but it was partly destroyed by a *hongi* fleet, commanded by the Singaji of Gebi, on which occasion more than 200 men were carried away.

The appearance of this kampong differs much from those already visited. The houses are smaller and generally stand on dry ground, a few however are on posts.

In the evening I went on shore to examine things more closely. It was difficult landing on account of the high swell on the beach and reef and we got wet. The extensive reef which surrounds the island has already been mentioned. It consists in madrepore limestone, which forms rocks here and there, but generally an uninterrupted mass of stones, with occasional cleavage and rents, showing the effects of the seawater by which it is undermined. At lōw water this reef extends for more than a cable's length into the sea. Behind it there is a sandy beach, 20 to 30 yards in breadth, covered with broken shells and remnants of corals, and further in jungle. The houses stand above the level of high water. Some had the form of Papuan dwellings, built on low posts, without internal divisions and much smaller, there being none above 20 feet in length. Only one of these dwellings was divided into three apartments. A single trunk of a tree with incisions serves as staircase. Other houses were built square, in the form of Malay houses. Others again were not higher than 6 feet, 40 to 50 long and 12 feet in breadth, with various openings in the outer wall for doors, which however are so low that people have to enter on hands and feet. This kind of house is also found on the west coast of New Guinea. At the back and sides there is generally only one door to be found. On entering, an uninclosed space is seen, with a kind of box or chest in the centre, in which earthenware, bambus for carrying water, empty calabashes, and other cooking utensils are contained. Most of the houses have only one fire place, a circumstance which, with the great number of houses, about 40, leads one to suspect that each family resides by itself. All had the appearance of a hasty flight; the abandoned pots, some with food in them; here and there pieces of smoked pork, some fruits, old weapons and nets, manufactured in the same way as at Ansus; baskets and boxes, some of which had been cut out of a single piece of wood; lances, arrows and bows, one of the last of the length of 8 feet; new made pots, which were placed to dry round the fire places, or were collected in separate houses; bambus for carrying water, and similar objects had been abandoned, as being of too small value, or too difficult of removal. We found the jaw bones of hogs in almost every house, which leads me to believe that they rear this animal on the island, or hunt them on the opposite coast. Here and there we found prepared sago, some fruits, as also the heads of shrimps or bones of various animals strung together and hanging from the roofs. Most of the houses were made of gaba-gaba with a roof of attap and the floor of gaba-gaba; there was one made of coarse planks, perhaps the dwelling of the head chief. I saw no mats. Perhaps they carried them all away. Before the openings in some houses there were slide-doors of kajang but without any other fastening than a wooden bolt on the inside.

There was something melancholy to see the whole kampong thus abandoned. A death-like silence prevailed where shortly before many voices had been heard, and our steps and conversation alone interrupted it, with now and then the howling of a dog.

The furniture which we saw scattered about, and the weapons and fishing gear, were made in the manner already described. I found in one of the houses a model of their prahus, made of gaba-gaba, which was exact in dimensions and neatly cut out.

I saw no traces of iron, probably because they had carried with them all the iron articles, as being of great value. The water cans (timbahs) made of the bark of trees, fans to kindle the fire, cocoanuts shells strung on a rattan to allure the fishes close to the prahus, a sieve made of the ribs of the leaves of palm trees to sift the sago, had been manufactured in the same manner as in Malay countries. Amongst these people, who have so little communication with others, is this imitation, or an original idea?

Close to one of the houses was a grave covered with attaps, with an inclosure of bambu, while the soil round it was cleared and kept clean. A kind of small altar had been built on it of the height of one foot, on which a skull was placed. Another grave in the vicinity had two skulls on the same kind of stand, and this circumstance leads me to suppose, that these heads had perhaps been taken by the inhabitant of the grave during his life time; it not being the general custom amongst the eastern people to bury more than one body in the same grave.

Plantain and cocoanut trees were planted round the houses. Some had an enclosure near in which flowers were growing. It being improbable that the inhabitants had much taste for flower gardens, I conjecture that these plants are for a medicinal or other purpose.

The forest behind the kampong is not very thick, and is intersected in all directions by paths, which lead towards the gardens, or towards the springs, or the felled sago palm trees. We found the yam and plantain plants in the gardens nearly choaked amongst the weeds and brushwood, a proof that they possess little knowledge of culture.

On some cocoanut trees sticks were fastened like steps, in order to facilitate the ascent. None of these trees had fruit, perhaps they tap them to obtain toddy (tuak). I saw some bambu pipes which appeared to have been used for collecting it. At many places in the jungle we found sago palm trees, some of which had been cut down and split, and close to the springs, large heaps of sago fibres and the usual preparations for the manufacture of sago, which would therefore appear to form the chief food of the inhabitants. They obtain from a tree, called *kekir*, long and strong fibres, from which they make their nets. A trunk of this tree lay close to one of the houses, of the thickness of half a foot, with thin, smooth, light brown bark covered with small points. The wood is very soft or rather like marrow, with long straight fibres, which are easily separated from the rest. After having been dried, the fibres are well adapted for thread. I believe that good cordage and perhaps coarse cloth may be made from it.

Although no botanist, the riches which nature exhibits here struck me. The variety of the species of trees, the creeping plants with their beautiful flowers, hanging from the branches like garlands, or surrounding the trees with the greatest variety of leaves, as well in colour as in form; the low brush plants with beautiful flowers, the great number of glittering coloured butterflies and insects, the powerful juicy plants of the tropical countries with their elegant forms, must strike every one who enters these forests.

The island, generally speaking, may rather be called low than high. On the south part only there is a hill of about 500 feet high. The island appears to be extremely fertile and well watered. A great number of small rivulets with clear water ran into the sea.

Here we filled our water, but the taking in of water is not easy on account of the heavy swell on the beach, and the extensive reefs. The opposite coast is low and thickly covered with vegetation. In clear weather the tops of some mountains are seen at a great distance. Many large mouths of rivers are seen along this coast. The mud, which comes from the rivers, has probably formed the extensive shoal which surrounds the island. According to the Singaji of Gebi, all these mouths are outlets of the Ambermo, which forms a delta; at all events he told us that during a *hongi* voyage, he entered one of these rivers, followed the course along various branches and canals, and at last came out close to the Arimoa islands. In fact the coast till past these islands, is everywhere low and flat.

The *hongi* fleet arrived and anchored between us and the island. The crews at once went on shore, and acted according to custom, pillaging the houses, cutting down the fruit trees, carrying all away that pleased them, and digging here and there, to see if the inhabitants had concealed anything. These proceedings cause the inhabitants to fear these visits to such a degree, that they prefer leaving all behind, rather than to await them. The Singaji of Gebi, who according to his own account had been here 6 times with *hongi* vessels, assured us, that on every occasion he had found the kampong completely abandoned. This being again the case, we were prevented from obtaining anything except some yams and plantains.

Through the abandonment of the kampong by the population, we were disappointed in our expectation of finding interpreters and pilots for the bay of Bougainville, for none of the Gebi or Tidore vessels have been so far to the East for the last 60 years. The language there also differs entirely from the language of the other tribes in the bay. Some directions however were given to us, by which we might be enabled to recognize the bay. We agreed with Captain Amir, that on reaching the bay of Bougainville we would await the *hongi* until the 3rd June, at which date they promised to be there, unless prevented by unforeseen circumstances. If they did not make their appearance by that time, we were to leave the place, after having set up the pillar there. These vessels find anchorage till close to the Arimoa islands, and from there to Bougainville bay many inlets where they can take shelter in case of bad weather. It is scarcely practicable for such vessels to remain at sea in heavy weather, and in case of contrary winds they can only advance with the tide in their favor. For this reason and on account of the small quantity of potable water they can carry, they are always compelled to keep along the coast, which renders their voyages very tedious. During this voyage we have experienced more detriment than advantage from their presence. Where we lay in their company the inhabitants were afraid and anxious. The few articles that were to be obtained were appropriated by them. By their plundering, moreover, which it is difficult to suppress without strong measures, they diminish the respect of the natives for the Netherlands flag, for they naturally confounded us with the *hongi*, and the chiefs of the *hongi* will, in future, boast of the accompaniment of a Dutch man-of-war, as if the Government approved of their conduct. We could do little or nothing to prevent their pillaging, having very seldom been in their company at any place.

On the morning of the 15th May we left the anchorage, and ran to the N.W. over an extensive shoal, which here extends some miles into the sea. In some places we had only 3½ fathoms with a hard sandy bottom. The depth in this direction was generally from 3½ to 5 fathoms. On the north side it increases gradually. As we passed the shoal at highwater, it is advisable for a large ship which wishes to make Kurudu to be very cautious in approaching that island, for we observed a fall of more than 6 feet at spring tide. During our stay there we had regular land and sea breezes, the first S.E. the last N.W. and a tide which turned every six hours and ran parallel to the coast at the rate of 1½ and 2 miles. At new moon there was low water at half-past twelve o'clock. Being outside the shoal, we experienced a heavy W.N.W. current, which at noon had caused us to loose a considerable distance. Closing with the shore we went better, and receiving the breeze, we had made 12 miles in our course on the following day. Along the shore we found anchorage everywhere, at the distance of two miles, generally in 10 fathoms increasing very gradually. Through calms and contrary currents on the 17th we lost all that we had gained, and drove to a distance of about 3 miles from the Traitor's group, a collection of low islands surrounded by an extensive and dangerous reef. I believe some of these islands are inhabited. On that day we had a current of 10 miles to the west.

By keeping close to the shore, we again, although very slowly, recovered our ground and on the 20th saw the greater part of the *korra-korras* of the *hongi* at anchor close in shore. They had not been able to advance much on account of the current.

It was generally calm during the night, which obliged us to anchor repeatedly and we then observed a current of 1½ to 1¾ miles per watch towards the west.

From Kuruda to King William's Island the coast takes an E. N.E. direction for 15 miles and as already observed is very low and covered with thick vegetation. On some places the tops of high trees appear above the low wood, which give some distinguishable points. On this part of the coast there are various outlets of the Ambermo. The principal one is at the point opposite King William's Island. On the morning of the 24th we had the point south at about 2 miles distance. We found its position to be 0° 28 N. latitude and 198° 0' E. longitude from Greenwich. We experienced a considerable current here towards the north, coming from the river, but only discernable on the surface of the water, the current running outward athwart the ship. On account of the mud it carried, the water had a dirty grey color. A strongly marked separation between the dark-blue and clear sea-water and the muddy and grey riverwater is visible, where both meet.

The breeze from the S.S.W. increased during the night of the 25th, by which means the Arimoa Islands were in view at day break. We passed them during the first watch of the same day on the south side, where we sounded 8 fathoms in some places. The Arimoa islands, called Kumamba by the natives, are three in number. The western is the highest, the one lying most to the east is low and long. Between these two islands, which are at a distance of about ¾ of a mile from each other, there is a small island or perhaps a cliff.

The coast opposite these islands, called Tabi, has a totally different appearance from the coast to the west of the point. Small detached hills rise above the lower land; these increase in height, join together, commence to form a chain, and show here and there high table-lands or some steep high tops of mountains, which are noted in the chart under the names of Mount Benoit, Amable, and are separated near the Cyclop mountains by Bougainville bay.

The last named mountains form a separate group, which is joined with the chain of mountains on the west side by low land; they have two tops reckoned to be 7,000 feet high.

The mountains are very steep on the S.W. side, but on the E. side they run in a symetrical declivity down towards Bougainville bay. The seaside is steep, and there is probably no anchorage anywhere. The coast of Tabi has various bays, of which Mataran cove is the principal. The general direction of the coast is E.S.E. Various small low islands lie close to the shore; in their vicinity probably anchorage may be found.

It was at this place that the crew of the *hongi* fleet, sent the preceding year by the Sultan of Tidore to conquer that part of the coast, was unexpectedly attacked during the night by the population, and compelled to put back.

The constant westerly wind caused the current to decrease and entirely stop and brought us on the 28th in view of Bougainville bay. This bay is recognisable by its position to the east of the high Cyclop mountains and Bougainville mount (a separate mountain, stretching above the low land in the east of the bay) and also by the presence of two islands in the outlet. The Tidorese call this part of the coast Tana merah, on account of various spots of red clay appearing here and there amongst the vegetation, and which were also observed by us. The entrance of the bay is about a mile broad. The bay runs deep into the country, for in clear weather we could scarcely see the south side. The entrance lies in 2° 20' S. latitude and 140° 47' E. longitude from Greenwich.

The west wind ceased on the 29th and was succeeded by a strong S. E. and E. S. E. wind, with a high difficult sea. The current not yet running with full power, with great difficulty on the 30th we brought the west point of the bay S. by E. ½ E. of us; but we could not bring it further owing to the current, which had been kept back by the west wind, returning with a force of 8 to 10 miles during the day, running towards the N.W. Notwithstanding all our exertions, and carrying sail as much as possible, we were driven to the west by the current. The steep rocky coast forming here a low barrier, we did not venture to approach it, as the high sea and the surf would undoubtedly have thrown us on the reefs if a calm had surprised us, in which case the vessel would have been irretrievably lost. We therefore tried to run to the north, in order to ascertain if the current was less heavy there. This also proved fruitless, for on again approaching the coast we found that we had been driven below the Cyclop mountains to more than 15 miles from the mouth of the bay.

The vessel in the meantime suffered much from labouring so heavily, and began to make water. She was lightened so much by the consumption of provisions and water, that she could not be kept in command, which made her lose ground the more. To this must be added the bad sailing qualities of the schooner, for, notwithstanding we carried as much sail as possible, she could not run more than 2 or 2½ miles at the most. If this had not been the case, in all probability the bay would have been reached and the voyage completely successful, for we had approached within about 3 (12 English) miles of the entrance.

Various reasons also made us deem the continuation of the voyage inexpedient. Owing to the abandonment of the kampong at Kurudu, we were unable to procure interpreters for that part of the coast, which would have prevented us from entering into communication with the inhabitants, although we had succeeded in reaching the bay, while the setting up of the pillar would have been a mere formality.

The *hongi*-vessels which we had last seen on the 23rd to the west of King William's Island, would also probably have failed in reaching the bay; and after the 3rd June, which was fixed as the latest time for rendezvousing there, they would not take much trouble as they could not expect to find us.

The crew, especially the natives and the detachment of soldiers, were suffering much from beri-beri, probably caused by the want of refreshments, having for three months used little else than rice and salted beef, and having only been able occasionally to procure a little fish and some yams.

The crew, before too weak, was from these causes so reduced, that there was scarcely sufficient hands left to carry on the duty. The return voyage to Amboyna would on many accounts be unfavorable, and a longer delay would occasion a scarcity of provisions; indeed, owing to the presence of so many people, besides the regular crew, on board, they were already beginning to fail.

All these reasons induced the determination to consider the further prosecution of the voyage inexpedient and to return to Amboyna. On the evening of the 16th June we therefore changed our course, after having been driven more than 17 miles to the west of the bay.

We did not however remain without any communication with the inhabitants of the coast. On the evening of the 4th and the morning of the 5th, driving during a calm along the coast at a distance of 2 miles, we came in view of an extensive kampong, which at that distance appeared to us to have much resemblance to the one at Kurudu. The houses were built on the dry ground, some on posts, but the greater number were low and long. Some prahus came towards us in which were 2 or 3 men and a large one with 9, who gave us large bundles of bows and arrows for some empty bottles and beads, but they asked chiefly for knives which they were anxious to have. The other articles they brought were useless, viz: leaves, empty cocoanuts, beaks of birds and such like; they also offered us some ornaments. These men had a savage aspect, but many had lively masculine physiognomies, and firm muscular arms and legs. They were as good as naked, for the little that deserved the name of dress consisted of some plaited fibres of trees fastened round the waist and hanging down like a fringe in front, which however formed little or no covering. Round the arms, legs and waist, they wore belts of twisted rattan, ornamented with small shells sewed to them, some of which they sold to us.

These men wear their hair in a singular manner. They plait it in long thin tresses and cross them on both sides round the head with a point forward, so that it resembles a helmet and would probably turn the cut of a sword; others have these tresses hanging down over the face; others again have the hair short and curled; two old men were completely bald. They had white feathers and flowers stuck in the hair. I did not see the common Papuan comb worn by any. Some wore small pieces of bone in the pierced nose, but this was not general. In the lobe of the ear they wore round pieces of bambu, carved on the outside. These pieces of bambu were so large that the ears hung down to the shoulders; others wore bone or brass rings in the ear, or along the temples. At the upper part of the arms they wore bundles of leaves, at the ancles white shells. Most of them were tatooed on various places, and I saw one with amulets. Many had strong beards, which they wore very short.

The bows and arrows, which they offered us for sale in great quantities, were 6 to 7 feet long. The first were of very flexible red wood, with rattan strings of the thickness of a finger, terminating in a loop which keeps the bow very strongly stretched. The arrows were of reed (bambu tali) with points of wood, bambu or obliquely cut bones; nearly all had barbs on one or two sides; some were square, with barbs on all sides. These points, hardened in the fire, were stuck in the arrows and fastened to them with black colored thread. The shafts and points of most of the arrows were carved and painted black. In the hands of experienced bowmen these bows and arrows must be dangerous weapons, for the arrows are projected with such force that they transfix a man. In our hands, however, they were completely harmless; we tried to shoot with them but could not succeed, for the arrows fell down at our feet.

The prahus which brought these men on board, were 10 feet long, the largest of 15 to 20 feet, broader below than above, where they were just broad enough to allow one man to stand with one leg placed before the other. In this position they use their paddles, which are very small and covered with carving. The outriggers are only on one side, generally two close together, parallel with the side.

The mast, a single piece of wood supported by stays, is stepped over the side on the outriggers. The stay on the windward side is fastened to the outrigger, the ends of which project a little on this side. The vessels being steered by means of the paddles, have neither stem nor stern, so that they can always present the same side to the wind. The sail is square, made of kajang mats and small in proportion to the size. At the mast-head and end of the yard, they had bundles of black cassowary feathers or fibres of gumuti, which at a distance have some resemblance to a flag.

The prahus are not, as at other places, raised high and ornamented with carved work, but are flat and low in the water. The prahu itself is slightly carved at the stem and stern.

These men did not appear to be afraid, but they would not come on board. Several times they tried to seize something or other, and they refused to give anything in exchange if payment had been made in advance, which proves that they are of a thievish and faithless character. They pointed to the shore, as if they wished to invite us to visit them, and that we would get many things there. I believe however that it is necessary to be very cautious, as they appear to be false and treacherous.

Their gestures were very lively; they spoke quickly and loud; the language appeared to differ from that spoken by the natives of the bay. In exchange for a bottle they gave us a very small young pig with an extraordinary large head, and four yellow stripes over the body, but elsewhere black. They also gave us a young dog. They could not keep up with us and returned to their kampong when the wind, increasing a little, drove us out.

After we had changed our course on the 6th June, as mentioned above, a S.E. wind and a N.W. current carried us during the night past the Arimoa Islands which we now passed on the northside. At noon of the following day we found ourselves off point d'Urville, and in the evening we came to an anchor to the north of Kurudu, it not being advisable to enter the passage between Jobi and Traitor's Islands during the night. We effected this on the following morning, assisted by a light breeze which we kept during the whole of the day, and which was interrupted in the evening for a short time by a squall of rain. During the night the current was so strong that the next morning we found ourselves past the Traitor's Islands, and close under the shore of Sowok. The south coast of Jobi is high and steep. The Traitor's Islands are all low. These islands extend to the Mysore group. We had to erect a pillar at Sowok. The strong current nearly drove us past the anchorage, but a rising zephyr assisted us greatly, and brought us in the evening close to the shore, where we were protected from the current by a bend of the coast. A small prahu came off with the chief of the kampong. This man offered to remain with us during the night and pilot us on the following morning. He told his people to return in the morning with a large prahu to take the pillar on shore. The night being very calm, we remained nearly on the same spot. The prahus came off very early from the shore, and were sent back with the pillar. At noon, being close to the shore, Mr Gronovius started with the boat, to point out the place. Towed by many prahus they soon reached the shore. The schooner followed under small sail, in order to examine the anchorage, if there was any, or if not to await their return. A small prahu soon brought information that at a ship's length from shore soundings had been obtained in 21 fathoms, which prevented us from coming to anchor. In the mean time the sky was cloudy, and the weather became squally, which compelled us to stand off shore, but we closed with it again as soon as the atmosphere began to clear. At 4 o'clock the boat returned on board and we continued our course.

The island Mysore, so called on the charts, is also named Schouten Island, and consists of three distinct Islands: Sowok, Mysore and Biak, the first of which is the more western, the second the most northern and the third the most easterly. A narrow strait separates the islands, but it is said to be unnavigable for vessels on account of the many rocks and reefs. However, I believe, that anchorage is found at the outlet on the southside; at least an anchorage is marked on that spot on the small chart of the Rembang. According to the Singaji of Gebi, there must be a sort of cove a little to the west of the kampong between some Islands and the shore, which is said to be an excellent anchorage, but we wanted time and opportunity to examine it. The Island Biak is middling high, but Sowok is very high and steep, and in that respect is similar to Run. To the south of the Island, which lies about one mile to the westward of the east point, there is found a low island, which like the rest is surrounded by an extensive reef, the greater portion of which was above water. A small reef runs along the land, and has an opening near the kampong, inside of which a small bay with deep water is found. A ship could lie here very safely, but from the difficulty of entering it would not be advisable to go in unless it was intended to remain for some time. I am not aware whether any vessel has ever entered. An extensive and beautiful kampong stands on a broad beach. The houses are built on posts, and these rest on rocks. They are better constructed and more carefully kept than at any other places which we visited. Round the houses were many cocoanut palms, especially near the banks of a river of clear and excellent water which runs through the kampong. In consequence of a shower of rain the river swelled so quickly, that in a few minutes it became twice as broad and deep as before, and brought down much earth and mud with it. On both sides of the kampong there are seen two other kampongs, consisting of 5 and 6 houses, which stand on the beach under cocoanut trees.

The people were very friendly; men, women and children surrounding us during our stay on shore. A few beads were thrown about for which they all eagerly scrambled. The same tranquillity and order prevailed, which had been observed at Run. The pillar was subsequently erected on the right bank of the river on a small elevation under the cocoanut trees. Knives were distributed among all who had assisted. In order to distribute them Mr Gronovius formed a circle and conversed with the chiefs, while he directed the knives to be laid down before him. On a sudden a man pressed through the crowded throng of spectators, and seized as many of the knives as he could carry; after which he again made his way through the crowd, and took to flight across the river, without any person making a movement to stop him. All our remonstrances could not procure their restitution, and the people even shewed signs of dissatisfaction, when they could get no other knives in the place of the stolen ones.

The dress was the same as at Run and Ansus. Fewer ornaments were worn in general, not even rattan bracelets on the arms; many however were tatooed, as in these places.

A piece of blue cotton, some beads and knives were bartered for a large pig. Pigs are bred here in great numbers. The female owner of this pig took an affectionate farewell of it; she called it, knelt down, embraced and kissed it repeatedly, spoke to it, and manifested her sorrow at being separated from it until it was bound and put into the boat. The flesh was good. We also procured a great quantity of fish which was also of excellent quality.

After having resumed our course at 4 o'clock, we saw 22 large and small vessels which we thought were the *hongi*, but it proved to be a mistake, as they did not come near us.

Although it was calm during the whole of the night, we were driven considerably to the west, and in the afternoon we drove along the east shore of the island Mysore, a very low island with an extensive reef on the north-east side. A deep bay closed in by reefs, lies about the middle of the island. On the N. E. point there is a kampong on the beach. A great number of canoes came out to us from which we procured some fish for the crew. The people in them were in all respects similar to those of Dori, both belonging to the same tribe and speaking the same language. The only peculiarity I remarked was that only a few of the men were tatooed. They had lances with lines for harpooning the fish.

Although we were in the middle of the S.E. monsoon, the wind was generally west of S. This added to the strong N.W. currrent, made us drive below the bay of Dori, notwithstanding we steered as high as possible. A free sea-breeze however allowed us to sail up and brought us into the harbour on the evening of the 12th June, when we took up our former anchorage after an absence of 49 days. On account of the variable and generally light breezes and heavy N.W. currents, it is advisable to steer as much to south as possible, otherwise a ship is likely to fall to leeward of the harbour, and would drive out of the bay in case of calms, when great difficulty would be experienced in working into it again. A great part of the population had gone with the Singaji and the son of the Singaji of Gebi to look after the *hongi*. On the day of our arrival and the following evening a festival took place, which is worth notice on account of its singularity.

As previously mentioned, the tribes are nearly always at war with each other, and on their return from a successful foray they bring in triumph the heads they have acquired. Ten days before our arrival a party which had been sent out returned with three heads from a successful expedition, which they now celebrated.

In the evening, about 5 o'clock, the people were divided into two parties, probably those who went with the expedition, and those who had remained behind. The first went to the jungle, the others assembled on the beach. A wild shouting and blowing on large perforated triton shells, which emitted a deep penetrating sound, gave notice that the party in the jungle were about to appear, and they were answered in the same manner by those on the beach. Soon afterwards the two parties joined, and consisted of about 30 men and boys besides two women. A similar festival took place in the large kampong on the interior bay, to which circumstance perhaps was to be ascribed the small number of persons present at this one. The men were dressed in their war-dress, and all had weapons in their hands. Some had two or three rows of white feathers stuck in their hair, which at a little distance gave them the appearance of the vendors of stucco images in Europe. Their dress generally consisted of a chawat of printed or coloured cotton instead of fig bark. All wore their best ornaments; many had silver rings in their ears, and broad silver plates round the wrists above the usual band of rattan. The women had red sarongs instead of the customary blue.

A slow circular movement commenced to the accompaniment of a monotonous song and the beating of the tifa, in which the men moved round in a small circle in pairs, one behind the other. This movement afterwards changed into a kind of dance, in which there was much gesture with arms and feet, but little progress. The dancers while running round made a hissing whistling noise. Outside the circle was a man, like the leader of the dance (chikalele,) with a shield and parang; the shield was half white, half black, with red figures on the white part, and white on the black part. This man, who had probably distinguished himself or brought in the heads, jumped about in a wild manner in the circle, flourished the klewang and beat the shield with it, jumping right and left.

All this took place on the beach in the vicinity of the ship, from whence the whole was distinctly visible. A kind of pandoppo had been built close to the spot, into which the revellers went and continued the dance without any change. The men struck the wooden inclosures with the klewangs, and the deep cuts shewed with what vigour the blows were given. At a small distance the three heads were exposed to view. They were skulls, with red stripes and spots on the skull, the under part of the cheek placed opposite the eyes and fastened with thread. The heads appeared to me, from the fading color and dull lustre, as well as from the want of most of the teeth, to be very old, while they had the appearance of having been buried for some time, perhaps to separate the fleshy parts from them. After the dance a feast followed of which all partook in groups of five and six. The provisions were served on round plates of wood, and consisted of rice cooked with pork, papeda, yams and dried meat, but all without salt, which they do not appear to know. All passed in perfect order, and looked much like meals taken on board a man-of-war. No one left the place before all had finished. Outside, exposed to view in two rows, were coarse Chinese cups, and round and square bottles, most of which they had received from us. I did not see any other liquor than spring water and cocoanut water, although they are great lovers of fermented drink. At Sowok only there was sagoweer.

After the meal, the dance again commenced by the light of torches and lasted without interruption until morning. Throughout the whole of the night we heard their shouts and monotonous song, which led us to suppose that they were exceedingly well pleased, and gave a loose to their joy.

The ship was repaired at Dori, (for which probably no opportunity would have offered at Amboyna at this season of the year) and the water filled up. The many sick people began to recover slowly. One native seaman only died from the effects of beri-beri. The rest, amongst whom were some severe cases, recovered. Generally speaking, the health of the crew has been excellent during the three months of our sojourn, and the sickness, chiefly amongst the Javanese, arose from the want of refreshments, which we could not procure, and not from the climate which I reckon healthy. There was little sickness amongst the Europeans.

From what I could judge during our stay on these coasts, there is little distinction between the different tribes of islanders. With the exception of a few men of Tabi, we had no communication with the mountaineers, or the inhabitants of the mainland to the east of the bay. Gentleness even to timidity, good nature, a sense of justice and chastity, appear to be general and the groundwork of their character. Placed under the rule of a civilized government, they would soon become attached to it, and would prove very useful. As they appear to be inclined to civilization, their abuses, such as kidnapping, taking heads &c. would soon be put a stop to, for these arise less from their disposition than their customs. A small garrison would easily keep them in subjection, and change them into industrious cultivators and honest men.

We left Dori on the 22nd June on our return to Amboyna. Having only one month's provisions on board, and the voyage at this time of the year being very uncertain, we could not remain any longer for the *hongi*, and a letter was left behind for Captain Amir. After a tedious passage we reached Amboyna on the 15th July, having only 5 days' provisions remaining.*

---

* The miles mentioned throughout this article are Dutch; 1 Dutch mile being equal to 4 English miles. *Tr.*

NARRATIVE OF A VOYAGE TO COCHIN-CHINA.*

By Charles Chapman, Esq.

Pursuant to my agreement with the Mandarin, we went on shore the 22nd of July, in the evening. He, together with several others, received us upon the beach, and conducted us to his house. When it grew dark, we were entertained by a set of dancing women: These ladies differed little in their performance from those of Hindustan. The music consisted of a kind of pipe and tabor, castinets, and an humble imitation of the violin. About 10 we retired to supper upon our own provisions. Mats and cots were provided for our repose. About 8 in the morning we commenced our march, my companions on horseback and myself in a silken net, extended at each end by a piece of ivory about 20 inches long, through several small holes, in which passed the threads it was woven with, which, being collected together, formed a loop, by which it was suspended to a pole in the form of a hammock; over the pole was a pinjaree of fine mats covered with painted paper; it requires but two bearers, for with that number I was carried 15 miles in the day without changing. Our road at first lay along the banks of a considerable river, till we entered a well-cultivated valley, which appeared encompassed on all sides with high mountains. In this valley we passed through three or four pretty villages pleasantly situated, in which, as well as on other parts of the road, were public houses, where tea, fruits, and other refreshments were sold to travellers. At noon we alighted at one of them, and partook of a dinner, which consisted of fowls cut into small pieces, dress ed up with a little greens and salt, some fish &c. We left the village about four in the afternoon, and in the dusk of the evening reached another, which was within an hour's ride of the king's residence; here we staid during the night.

Early in the morning we pursued our journey through the paddy fields, and at 8 o'clock came in sight of the fort his Majesty resided in. The east front, by a gate at which we entered, extended about three quarters of a mile, and was merely a straight stone wall, in many places much out of repair, without guns, embrazures, flanking towers, or any other requisite to make it a place of strength. It is sufficient, however, for the purposes of its possessor. I was informed it was a square, and that the other sides corresponded with the one we entered at. When we came to the gate, we waited half an hour in a hovel; the gate and wall were entirely without guards, and the ground within laid out in paddy fields. We then proceeded on about half a mile, when we alighted at the house of the king's son-in-law, where we staid about half an hour, and partook of some beetle. He then conducted us to a house near his own, which he said was allotted for our residence. He requested to see what we had brought for the king, which we shewed him. The king, he said, would grant us an audience next morning; afterwards he took his leave.

---

* Continued from p. 302.

By six o'clock next morning, a message was brought us, that his Majesty was ready to receive us. We then attended our conductor for near a mile, till we came in sight of the palace from an eminence; here we were desired to dismiss all our attendants, and to leave our swords, as it was never permitted to any body to enter into the presence with arms. These preliminaries adjusted, we advanced towards the palace; In the front were drawn up two ranks of men, consisting of 100 each, with spears, pikes, halberts, &c. of various fashions, with some banners flying, and from within appeared the muzzles of two long brass cannon. In the middle of a gravelled terrace, in front of the palace, was laid the presents I brought. As soon as we ascended this terrace, the Mandarin and conductor told us to make our obeisance in the same manner as he did, which consisted in prostrating himself three times with with his forehead to the ground. This mode of salutation, however, appearing to us rather too humiliating, we contented ourselves with making as many bows, after the English fashion. We mounted half a dozen steps to the apartment his Majesty and his Court were assembled in. It was open in the front and at the sides, the roof tiled and constructed in the Cochin Chinese fashion, supported by fine wooden pillars, the back part wainscotted; against this was placed the throne, which rose two or three steps above the floor of the apartment; and on the eminence stood an arm chair, painted red, and ornamented with the heads of dragons, in which the king sat, having before him a small table covered with a red silk cushion, wrought with gold flowers, for him to lean upon. On each side the throne was placed a chair; in one was seated his brother, the other was empty, and, as I understood, belonged to another brother, who was then at Donai. Several rows of benches were behind these, and upon them were seated the Mandarins, according to their rank. The king was clothed in a robe of silk of a deep yellow, upon which dragons and other figures were wrought in gold; upon his head he wore a kind of close cap turned up behind, the front ornamented with some jewels, and on the top of it was a large red stone, through which passed a wire, raising it a few inches, which shook and spangled as he moved himself. The Mandarins were, many of them, clad in gowns of silk of different colours, adorned with dragons, and their caps with flowers of gold or gilt. Round their waists they wore girdles, some of which were covered with scarlet broad cloth, fastened with clasps of gold, and decorated with cornelian stones, set in the same metal. Upon the whole, the appearance was a fine one; and although the scene wanted many of the requisites which constitute grandeur and magnificence amongst other Eastern

Princes, as a profusion of jewels, carpets, attendants, &c. the regularity and decorum observed here, presented one with some adequate ideas of a powerful sovereign surrounded by his Court. In the front was placed a bench for me and my companions, where we were seated next to the king's son-in-law.

I then, through the interpreter, addressed myself to the King, telling him that "I was a servant of the English Government in Bengal, from whence I had been deputed to settle a commercial intercourse with the inhabitants of Cochin China." He said "that the fame of the English exploits at sea had reached him, and that he heard they exceeded all other nations in the number of their ships, and excelled in the management of them; but they made an ill use of the advantage; for he had also been informed, that they indiscriminately attacked and plundered whatsoever vessels they met with: That he was very willing to permit the English to trade to his ports, and hoped that they in return would not molest his galleys, boats, or other vessels." I replied "that the first part of his information, respecting the power of the English by sea, was strictly true; but the latter was absolutely false, and must have been insinuated to him by those who were jealous of our prosperity, and wished to give him an unfavourable and unjust opinion of us. That the English were at the present time at peace with all foreign nations; and that their ships resorted to almost all the parts in the known world, where their merchants were renowned for their probity and the fairness of their dealings." He then acquainted me, that the English might trade to his ports; and after some explanation, it was at length settled, that for vessels of three masts 7,000 Quans should be paid (they allowed us five Quans for a Spanish dollar,) for those of two masts 4,000, and smaller ones 2,000 Quans each.

His Majesty soon after withdrew to his private house, where we were shortly afterwards requested to attend him, divested of his robes and cap of state, and having on a plain silk jacket, buttoned with small diamonds, and a piece of red silk wrapped round his head in the form of a turban; here our conversation was general: He began with repeating his good intentions towards the English, and how desirous he was of connecting himself with us—that although, to save appearances before his council, he had mentioned a sum of money to be paid by our ships for the liberty of trading, yet to procure the friendship of the English nation he would never exact it from them, but would shew them every indulgence in his power. He enumerated the articles produced in his country, as pepper, cardemoms, cinnamon, agula wood, elephants' teeth, tin, and many others, which he said the ignorance of his people prevented them from making the most of; and that for this reason, as well as for instructing his people in the art of war, he earnestly desired that the Governor of Bengal would send him some capable person.

He then disclosed some of his future designs to me; they were no less than to subdue the kingdom of Cambodia, with the whole Peninsula, as far as Siam, and the provinces belonging to Cochin China, to the north, now in the hands of the Tonquinese. To effect these, he wished for the assistance of some English vessels; in recompence for which he would make them such grants of land for settlements as they might think proper.

I promised him faithfully to report what he had said to the Governor General in Bengal. He particularly requested, amongst other things, that I would procure a horse to be sent him, cost what it would, by the first vessel to Cochin China, of a bay colour. After being treated with tea and beetle, we took our leave. In the evening he sent me three papers; one, sealed with the great seal of the kingdom, set forth the conditions upon which English ships were to trade to his dominions; the other two were sealed with a smaller seal; one describes the horse, &c.; the other contains his licence for visiting any of his ports.

The next morning we set out on our return to the vessel. We reached Quinion the same day (July 26), and in two days after sailed for Turon. Upon the road, coming from court, we were passed by his Majesty, who was going, on account of some bad news from his fleet at Donai, to perform a sacrifice at a temple situated in the bay our vessels lay in. He travelled in a neat palanquin, distinguished by its being red, which colour no subject is allowed to use in dress or equipage. The ceremony, I was informed, consisted chiefly in bowing his head to the ground, and sacrificing a buffalo.

Ignaack himself is allowed to have abilities, but these are ill seconded by the Mandarins who govern under him; they are all low illiterate men. Famine, and its attendant, pestilence, have destroyed one half of the inhabitants of the country. Shocking are the accounts of the methods taking by the remainder to preserve a miserable existence: At Hue, the capital, though in possession of the Tonquinese, and better supplied than any other place, *human flesh was publicly sold in the Market.*

The force of Ignaack by land is very inconsiderable, and so deficient in the military art, that I may safely aver that 300 disciplined men would rout his whole army. His marine force, consisting of a few gallies and some junks seized from the Chinese, is almost as despicable. Finally, his government is held in the utmost detestation; yet the spirits of the people are so broken by the various calamities they have been afflicted with, that they want courage to resist it effectually. Many of his soldiers, and almost all principal people I met with, openly declared to me how reluctantly they submit, and expressed their wishes that the English would take them under their protection; assuring us, that upon the least appearance of a force, the whole country would fly to join them.

About two degrees to the north of Quinion lies an island called Pulo Canton, and, between thirty and forty minutes north of this, another, named Pulo Campella; the latter possesses a convenient place for the ships to anchor in, and other advantages. Upon the continent, opposite to this island, is the entrance of a river, by which the junks go up to Faifo, and there is a branch of it which falls into the harbour of Turon.

"We anchored in Turon bay the 2nd of August. Having obtained permission, I hired a house in the village of Turon. There are the remains of several large and good houses here, which had been destroyed in the late troubles. The land in the neighbourhood of the village was cultivated with rice, brinjalls, and some sweet potatoes. The country farther back seemed entirely neglected; covered, however, in several places with groves of oranges, limes, jacks, plantains, and bambus, in most of which were the remains of dwelling houses. When I had been here three or four days, the Mandarin who governs the province of Cham on the part of Ignaack, came down the river, attended by four gallies, rowing between 40 and 50 oars each, and landed at a house on the opposite side to where I lived; the same day he sent to know when he should wait on me. I chose, however, to be first to make this compliment, and crossed the river in one of his gallies for that purpose. He received me in great form, himself seated on a bench placed on an eminence; the inferior Mandarins and soldiers, to a considerable number, placed on each side of him. This being the Mandarin with whom the dispute had happened the preceeding year, (after presenting him the passport I had received from the King,) I begged he would inform me how it had arisen, and the cause of his severity to the people who had fallen into his hands. He replied, "That the commander of the English ship had been prevailed on by some Mandarins of the former Government, then in arms at Turon, to assist them with men and arms, and that the ship's boat being sent up the river with them, had been attacked by his people, and taken; that some of the crew were killed, some jumped into the river and were drowned, and some fled into the woods, where they perished with hunger." He then gave me a licence for trading, strictly enjoining all persons to pay for what they purchased, and in nowise to molest or ill-treat us. After he had given me an invitation to visit him at Faifo, I took my leave, and he returned the same night.

The 13th I set out for Faifo. At one of the places where we stopped to give an account who we were, we found ourselves under a high mountain, part of which impended over the river, and it seemed ready to tumble and bury us under its ruins. It was a large mountain of white marble, situated on a low plain close to the water side, unconnected with any of the distant hills. We could perceive several cracks and holes in the body of the mountain, and round it were lying some vast fragments. The eye, in wandering over it, presented the fancy with the ideas of pillars, houses, towers, &c. Near it were a few huts inhabited by stone-cutters. I did not see any other specimens of their ingenuity than pestles and mortars of different sizes. On our arrival at Faifo, we were surprised to find the recent ruins of a large city,[*] the streets laid out on a regular plan, paved with flat stone, and well-built brick houses on each side. But alas! there was now little more remaining than the outward walls, within which, in a few places, you might behold a wretch, who formerly was the possessor of a palace, sheltering himself from the weather in a miserable hut of straw and bambus. The temples and their gods, however, were no further molested than in being robbed of their bells, which were seized for the purpose of being coined into money. After taking some refreshment at Faifo, I set out for the residence of the Mandarin, which was within an enclosure formed by driving strong stakes into the ground, intermixed with bambus growing, and for some distance round it short-pointed bambus were driven obliquely into the ground, as if designed to keep off cavalry. The house was spacious, partly consisting of brick, and partly of thatch and bambus. This Mandarin was almost as well attended as his master, Ignaack: several of his people were well dressed, and had swords in their hands; the hilts and scabbards were ornamented with plates of beaten gold. My conversation with the Mandarin was but short; I was informed that he was an illiterate man, and had the character of being cruel and oppressive.[†] I staid only one day, and returned to the vessel, being now the 15th of August.

---

[*] It was taken and destroyed by one of Ignaack's Generals. Before that it was a place of very great trade, and furnished cargoes of sugar, cinnamon, pepper, &c., to hundreds of junks, which resorted thither from all the sea-coasts of China and Japan.

[†] The following instance of almost unparalleled cruelty and perfidy was related to me at Faifo:—There was a certain distant relation of the royal family, who lived in disguise in that part of Cochin-China possessed by the Tonquinese, with whom this Mandarin had some acquaintance. He made it a pretence to send him a pressing invitation to come and reside under his protection, with his family and dependants; not only assuring him of personal security, but promising him his friendship. The poor man deceived by these specious professions of personal regard, set out with his wife, his children, and the rest of his family to a considerable number. When arrived in Turon bay, he procured an expeditious conveyance to the Mandarin's residence, leaving his family to follow him in their boats. He was received by the Mandarin apparently with the highest marks of satisfaction and regard. They partook of a repast together, and, when it was finished, the Mandarin told him that his attendants would conduct him to a house he had prepared for his reception; but he had no sooner passed the threshold, than he was seized by his soldiers, and had his head immediately severed from his body. He then embarked in one of his galleys to meet the family. As soon as he had reached their boats, he caused the women and children to be bound together, and thrown into the river, seizing all they had brought with them for his own use.

On my return on board the Amazon, I was visited by a Portuguese merchant just come from Hue, the capital of Cochin China. He told me, he was charged with a verbal invitation to me from the Tonquinese Viceroy, to proceed thither and dispose of any articles of trade we might have remaining. Having previously dispatched my writer and Mr Moniz with a letter to the Tonquinese Mandarin, requesting his favour, and hearing that there was but a small depth of water upon the bar of the Hue river, I proposed to the commander of the Jenny to go in his vessel, which might give him an opportunity of disposing of his investment. He consented; and leaving the Amazon in Turon bay, I embarked with Mr Bayard, the 18th of August. We anchored in the bay of Chimay, which is the boundary of the Tonquinese possessions; here I was met by my writer, accompanied by a Mandarin, named Ong-ta-hia, with an answer to my letter, containing the permission of the Viceroy to proceed to Hue. When we came to the entrance of the river, the Mandarin stationed there came on board on a galley, with a number of soldiers, and undertook to pilot the vessel in.

Two days afterwards I proceeded up to the town. Towards the sea, the land was sandy and barren; but on advancing, the scene gradually changed, the lands put on every appearance of fertility, and we saw the husbandmen on the banks busied in cultivation. Abreast of the town, twenty-five Chinese junks were at anchor; innumerable country boats were passing and repassing; and the shore was thronged with people. We landed at Ong-ta-hia's house; it was the resort of the Chinese, as his office consisted in reporting the arrival of their junks, and procuring them their clearances. The next day we visited the Viceroy. He resided at the palace of the kings of Cochin-China, six miles higher up the river than the town I landed at. The Abbé Raynal informs us its circumference is a league, and the walls of it planted with thousands of cannon. This description is certainly heightened: I visited it several times myself, and a person who accompanied me found an opportunity of examining the whole. The fortification is an oblong square; the greater sides extended about half a mile, the lesser two-thirds of that distance. It is formed by a retaining wall, behind which a rampart of earth 10 or 11 feet high was thrown up, with steps rising to a convenient level for the discharge of missile weapons. It had no embrazures, the guns being pointed through a kind of port-holes made in the bottom of the retaining walls. The number mounted was about 60; the largest nine pounders. For six or eight feet without the wall, short pointed bambus, from six to twelve inches long, were driven obliquely into the ground; beyond these was a ditch eight feet wide, and as many in depth, fenced with bambus growing, which was succeeded by another space with pointed ones driven in the ground, and the whole emcompassed by a low chequered bambu rail. The ground within the fort was divided by a number of brick walls, meeting at right angles, and forming squares. Some were allotted to the holding markets; others to granaries, quarters for the soldiers, stables for horses, elephants, &c. The whole was much out of repair.

The palace deserved the name of a good lower-roomed house. The building was laid out in spacious verandahs and private rooms. In one of the verandahs I was introduced to the Viceroy; I found him swinging in a net hammock, extended between one of the pillars and the wainscot of the inner apartment. He was a venerable old man, about sixty years of age, with silver beard, and most engaging manners. His dress was plain and simple, consisting of a loose gown of black glazed linen, with large sleeves, and black silk cap, and sandals on his feet. I acquainted him with my business in Cochin-China, much in the same terms I had made use of to Ignaack. I then requested he would receive the present I brought him as a small token of my respect. He then descended from his net, and seated himself upon the ground. He approved of my proposal to form a commercial intercourse with his nation, and would promote it all in his power. He then enquired several particulars respecting the nation I belonged to; as, our force by sea and land, our commerce, customs and religion. He also examined our hats, swords, and other parts of our dress very minutely. He then requested us to partake of a repast consisting principally of minced fowls, vegetables, pork, buffalo,, beef, fish, rice, sweetmeats, tea, spirits, &c, during which several war elephants were brought into an area fronting the verandahs, where some figures representing soldiers were placed in ranks; these the elephants attacked with great fury, seized them with their trunks, tossed them in the air, and trampled them undert their feet. Some soldiers were employed in shooting at a butt with long matchlocks, which had swivels and three-legged stands to fire them on. After a renewal of his professions of friendship and regard, we stood up to depart; he ordered all the Mandarins who were with him to attend me to the General's, to whom it was necessary he said I should make a visit whenever I came to him; he then forced our acceptance of two ingots of silver as an equivalent for the present (a gold repeating watch set with a few small diamonds and emeralds,) I had made to him, and we departed. Attended by a numerous train of Mandarins, who marched before and behind us in ranks, we presented ourselves at the gates of Quan-jam-quen, who is an eunuch, and commander in chief of the fleet and army. Half an hour elapsed ere we were ushered into a large hall; we seated ourselves upon some chairs placed for us before a rattan screen, from behind which a shrill voice called our attention to the object of our visit. He did not however become visible till the common questions were passed, and I had acquainted him with the reasons of my coming to Cochin China. The screen was then turned up, and a glimmering light, diffused from a small waxen taper, disclosed to our view, not the delicate form of a woman the sound had conveyed the idea of, but that of a monster, disgustful and horrible to behold. He was sitting in a kind of boarded shrine, in form like a cloaths-press. He was short in stature, which was however amply made up to him in bulk; and I may venture to affirm he measured an ell over the shoulders. Great flaps hung down from his cheeks, and his little twinkling eyes were scarcely to be discerned for the flat folds which formed deep recesses around them. He hardly appeared civil, and received my present with indifference. In my subsequent visits I found he was a great pedant, and valued himself much on his knowledge of books.

A month elapsed in mutual intercourse of civilities. I had hitherto resided in the house of Ong-ta-hia, but finding it inconvenient, I made repeated applications to him for a separate one; he as often evaded complying; and by his underhand influence prevented my hiring one. He was afraid, should he suffer me to remove from under his own eye, some parts of the unreasonable profits he hoped from his connection with us, might escape him; and his unwillingness to discharge the amount of his purchases that he had made from us may be considered as the first causes leading to the troubles we were afterwards involved in. As I found this man was the particular agent of the eunuch, I made him several considerable presents, but all inadequate to satisfying his rapacity.

The latter end of September the rains were so heavy, and the floods came down with so much violence from the mountains, almost the whole town was overflowed in one night, during which the noise made by the rushing of the water through the streets, and the cries of the people removing their effects, was horrible and alarming beyond idea. In the morning great numbers of boats were passing in the streets. Notwithstanding these floods happen several times during the periodical rains, few precautions are taken by the inhabitants to secure themselves against the sometimes melancholy consequences; and the government is so absurd as not to allow an upper-roomed house to any one but their sovereign.

Attention to our health obliged me to be urgent with Ong-ta-hia for his consent to remove to a drier situation; and the application apparently reconciled him to it: it was only in appearance; for three days after, a young man, who, with his father, served me as linguists, complained to me that he had been severely beaten by Ong-ta-hia for being instrumental in my leaving his house. The following day I was warned by the same person of his going to put to death two of my people. I immediately hastened to his house, accompanied by Mr Totty, and found them busied in binding a poor sick Frenchman and a cook belonging to Captain Hutton to the pillars of the house. Ong-ta-hia was standing with a drawn sword, and foaming at the mouth with passion. I requested to know the reason for such conduct, but he replied not, and withdrew: I afterwards found it was in consequence of some trifling difference between the Frenchman and a woman in the bazar who sold eggs. The Doctor and myself released the prisoners without any opposition, promising that they should, nevertheless, be delivered up to the Viceroy, for an investigation of their conduct; which being done, a decision was given in our favour. No redress, however, was to be obtained. About this time I received a letter from Captain Maclennan, acquainting me that the bad state of his health had led him to resolve on bringing the vessel up to the mouth of the river, that he might land and try the benefit of a change of air.

I was exceedingly sorry that Captain Maclennan's health should render so imprudent a step necessary: I was convinced it would alarm the Government. I hastened to the Viceroy and Eunuch, and acquainted them with the cause of her approach; notwithstanding which a parade of guards was made, and a number of precautions taken.

The Amazon anchored at the mouth of the river. The captain came on shore, but in such a situation as to preclude all hopes of his recovery. Having been given over by our surgeon, he tried the physicians of the country. All was in vain, and Captain Maclennan breathed his last the 2d of October. The 7th of the same month was fixed for his funeral, and early in the morning we assembled to attend it. The Portuguese burial ground, where I purchased permission to deposit his remains, was at the distance of seven or eight hours journey. The beauty of the country round this spot was not to be equalled by that of any I had before seen in the East.

The behaviour of the Chinese had latterly been very suspicious. On my first arrival they supposed I was come with a force to avenge the wrongs done to the English ship the year before, by the Mandarin commanding at Turon, and seemed to vie with each other in supporting any designs I might have, either against the Tysons or the Tonquinese themselves, from the hope of coming in for a share of the plunder, which would compensate them for the losses they had before sustained. Disappointed by the repeated declarations of my intentions being entirely pacific, they were afraid it would prove to them rather detrimental than otherwise. An alteration in their behaviour to us soon became evident. They represented to the Mandarins that the English were come to deprive them of their country, and invented a number of falsities the most absurd and groundless. I was frequently warned that they intended to plunder us. Our lives and property were equally at their mercy. My house was perpetually filled with Mandarins, sent to hear and adjust these fabricated grievances, from whence there was no other way of dislodging them than by presents: this in the end only proved an inducement to fresh parties to visit me, and something or other was daily devised to give me trouble. I avoided every thing I could that might tend to altercation. When I represented my case to the Viceroy, he referred me to the Eunuch, and only regretted his want of power to afford me redress. From the Eunuch, whose province it was to adjust all these differences, an accumulation of injuries and insults was all I could procure.

Things continued in this disgraceful situation till the beginning of November. The monsoon beat with great violence on the coast, and our prospect of getting away, which we anxiously looked for, was still distant. A few days after the vessels anchored in Hue River, the Mandarin we brought from Bengal left her, and retired amongst some of his relations who lived in disguise at a short distance from town. From the time of my arrival in Cochin-China, I continued to receive the strongest proofs of the gratitude and attachment of this poor man, and it will presently appear that we were indebted to him for the preservation of our lives.

From the beginning of October I received frequent hints that the government had treacherous designs against us; that the Eunuch, our declared enemy, had brought over the majority of the Council to his measures. On the 7th of November, as myself and Mr Totty were sitting at breakfast, a messenger came in from our Mandarin, and desired to speak with me immediately. He told me that his master, alarmed at the danger we were in, and anxious for our preservation, had sent him to advise us to secure ourselves on board the vessel without delay. He added that the King* of Tonquin, instigated by the representations of the eunuch, had sent an order to the Government to seize our vessel; that the Mandarins were arming their galleys, and had ordered their troops to be in readiness for service; and concluded by exhorting us to take instant measures for our security. This intelligence was presently corroborated by the landlord of the house we lived in, who informed me that the Tonquinese had determined to seize our vessel, and that he hourly expected a party of soldiers being sent to secure our persons.

Having, therefore, put what we had most valuable into a small country boat I kept in pay, Mr Totty and myself, with three or four Bengal servants and some Chinese rowers, left town between eight and nine in the morning, and reached the vessel at noon. The following day (November 8th) my writer, whom I had left in town, contrived to send a great part of my baggage on board the vessel.

---

* The Sovereign of Tonquin has only the shadow of authority; the whole power, since the beginning of the fifteenth century, having fallen into the hands of the General.

On the 9th, in the morning, five Portuguese, in consequence of our sudden departure, fled from town on board our vessel, for safety. In the evening, they were followed by my writer and another Portuguese, disguised in the habits of the country. All hands now joined in putting our little bark in the best state of defence she would admit of. Our force consisted of the Captain and Mate, one English sailor, two Frenchmen, two Portuguese, and thirteen Lascars, which, with myself, the doctor, my writer, and our servants, amounted to about 30 persons. The vessel was armed with seven or eight old and very bad two-pounders, for which we had scarce any shot, two swivels, some wall pieces, and twelve muskets.

The 10th, I sent to the Mandarin of the look-out house just opposite where we lay, requesting he would send me a writer, as I wanted to write a letter to the principal Mandarins. He complied. I wrote to them my reason for leaving town so suddenly, but added, I did not believe them guilty of so base a design, though prudence required me to be on my guard for our own safety.

The 13th, we discovered some galleys and large boats come from town, which brought to at a little distance from where we lay; we learnt that they were laden with guns and stores, to erect batteries to prevent our escaping them.

The 14th, at day-break, we discovered two large armed galleys, full of men, dropping down with the tide upon the vessel, as if with an intention of boarding us: we hailed them, and desired them to keep clear of us; but no answer was made. The Captain then requested permission to fire at them; the people in the forecastle accordingly fired some swivels and two or three guns at them. Upon this the galleys immediately dropped their anchors, and numbers of the people jumped into the river. I now determined to follow up what we had begun, and ordered two jolly boats to be manned and armed, and sent them to bring off the galleys; furnishing them with a few hand grenades each, which I directed them to throw into the galleys before they attempted to board them. These directions being observed, on the bursting of the hand grenades, 30 or 40 more from each of them jumped overboard and swam to the shore. Our people then towed them off, together with five others, which lay near them; all of which we destroyed, except one with a brass gun in her, about a twelve-pounder; she, however, foundered in three days after in a gale of wind, astern of our vessel. The largest of these galleys was about 50 feet long and 12 feet broad, armed with spears 20 feet long and matchlocks, with great quantities of powder and balls.

Conscious, however, that they were now preparing their utmost force to attack us, and that the various messengers they were sending, on pretence of making an amicable adjustment of differences, were nothing more than so many pretexts for protracting our departure, I was still exceedingly apprehensive for the safety of the vessel in attempting to cross the bar at the present inclement season. From this consideration, I determined to write to the commander of the Amazon to come (if practicable) to the mouth of the river, and favour our escape, or to send us his boat to assist us in getting over the bar. On the 16th I pressed a boat for this purpose, and dispatched her to the Amazon.

The seven following days the weather was so exceedingly bad we began to doubt of the boat's being able to reach Turon. In this interval several messages passed between the Viceroy and me. He still continued his assurances of friendship, and invited me to an interview. The bearers, however, as regularly assured me of his insincerity, and informed me of the preparations carrying on against us; and that the badness of the weather had destroyed four fire-boats they had constructed to burn our vessel, and which had retarded an attack being made on us; that numbers of guns were carried to erect batteries at the mouth of the river, in order to prevent our crossing the bar.

The 24th, the weather being a little settled, we moved our vessel a little farther out. We now discovered crowds of people on shore busied in erecting batteries, &c. We fired some shot at them, but, owing to the smallness of our guns, gave them little interruption. At six o'clock in the afternoon three or four guns began to play upon us, and continued till it was dark, but without any effect. The boat now arrived which I dispatched to Turon; by her I received the guns and shot I had desired, with a letter from the Captain of the Amazon, informing me he had sent his boat, with three Europeans and five Lascars, to our assistance, as it was not possible to come up with his vessel.

In the night I was awakened by some shocks of the vessel striking the ground. I immediately went upon deck. The scene which then presented itself was dismal to the last degree. The heavy swell having driven the vessel from her anchors, she was then thumping her bottom upon a hard sand. Not a single person was keeping watch. The Captain and his Mate, overcome with fatigue, were both asleep: the rest of the ship's company, to shelter themselves from the rain, were all in the hold. The country boat had broke loose from our vessel, with two of our people on board, and was never afterwards heard of. Being low water, when the tide rose we fortunately got the vessel off without damage. At day-break the Tonquinese began a heavy fire at us; their shot flew high, and the only damage we sustained was in the rigging. We returned their fire, but with little effect.

The 26th, several shot struck the vessel's hull, and one killed the only English sailor we had on board. About noon a cry of joy resounded from every part of the vessel, that the Amazon's boat was in sight; but the surf being so exceedingly high, we almost despaired of her being able to reach us; unfortunately she made choice of a part of the channel where the surf broke with the greatest violence, and no sooner had she entered it than she disappeared; being unable to afford them the least assistance, we concluded the whole boat's crew must perish. The Tonquinese observing the accident, elated with joy, fired at us with redoubled fury. In about an hour the heads of two men were discovered swimming towards the vessel; our boat instantly put off to meet them, and shortly returned with two Englishmen; they informed me that a Dutchman was lost in the surf, that some of the Lascars had reached the shore, and that the Tonquinese, with wanton cruelty, during their perilous situation, fired at them with small arms.

The 27th, all our fore-top-mast rigging was shot away; one shot struck the vessel between wind and water, which however was repaired with some difficulty.

The 28th, additional guns began to play, and several shots struck us weighing nine pounds. The try-sail-mast was shot away; the best bower cable parted close to the hawse hole, being cut with a shot. Our situation was now truely alarming, and the injury we had sustained was very material. To pass the bar while the wind was in its present direction was impossible; to return to our former station in the river, where the batteries would still be nearer to us, was returning to inevitable ruin; and to remain where we were, exposed to the fire of nine or ten pieces of cannon, was certain destruction. Critical as our situation was, it was necessary that something should speedily be done. After a consultation, we at length resolved (though with little hopes of success) to try to bring about a reconciliation.

The 29th, at day-break, I ordered a white flag to be hoisted at our top-gallant-mast-head; and our people beckoned to the Tonquinese to come on board. They immediately pulled down their war flags and beckoned to us in return. The Tonquinese, as we supposed, were waiting for orders from town, and suffered us to remain unmolested the whole day. In the evening the wind changed, and at half-past nine was at W. S. W. Our anchor was immediately weighed, our sails set in the most profound silence, steered S. by E. through a channel not more than 60 yards wide, and, notwithstanding the darkness of the night and the breakers still running high, at half-past ten o'clock we crossed the bar. The Tonquinese then perceived we were giving them the slip, kept up a brisk fire at us, till long after we were out of the reach of their guns; but not a shot struck us. The wind continued favourable the whole night; the next morning at eleven o'clock we anchored in Turon bay, at which place we repaired the Jenny.

The 18th of December we left Turon, when the Jenny was separated from us in a gale of wind, which, continuing with such violence, prevented us from again touching at Cochin China. We then bore away, and on the 23rd of December 1779 anchored in Malacca roads, sailed from thence the 8th, and arrived at Calcutta the 16th of February following.

Cochin China, called by the natives Anam, extends from about the 20th degree of north latitude, to Pulo Condore, which lies in 8° 43'. It is bounded by the kingdom of Tonquin on the north, from which it is separated by the river Sungen; by the kingdom of Laos, and by a range of mountains which divides it from Cambodia, on the west; and by that part of the Eastern Ocean generally called the China Sea, on the south and east.

The kingdom is divided into twelve provinces, all lying upon the sea coast, and succeeding each other from north to south in the following order: –

Ding oie, Cong bing, Ding cat, Hue (or the Court), in the possession of the Tonquinese; Cham, Cong-nai, Quinion, in the possession of Ignaack; Phuyen, Bing khang, Nab tong, Bing thoam (or Champa), dubious whether subdued by Ignaack, or still in the possession of the king; Donai, in the possession of the king.

The breadth of the country bears no proportion to its length. Few of the provinces extend further than a degree from east to west, some less than twenty miles. Donai, which is properly a province of Cambodia, is much larger.

The whole country is intersected by rivers, which, although not large enough to admit of vessels of great burthen, yet are exceedingly well calculated for promoting inland commerce.

The climate is healthy, the violent heat of the summer months being tempered by regular breezes from the sea. September, October and November are the season of the rains; the low lands are then suddenly overflowed by immense torrents of water which fall from the mountains. The inundations happen generally once a fortnight, and last for three or four days. In December, January and February there are frequently rains brought by cold northerly winds, which distinguish this country with a winter different from any other in the east. The inundations have the same effect here as the overflowings of the Nile in Egypt, and render the country one of the most fruitful in the world. In many parts the land produces three crops of grain in the year. All the fruits of India are found here in the greatest perfection, with many of those of China.

No country in the east produces richer or a greater variety of articles proper for carrying on an advantageous commerce: cinnamon, pepper, cardamoms, silk, cotton, sugar, agula wood, japan wood, ivory, &c. Gold is taken almost pure from the mines; and before the troubles, great quantities were brought from the hills in dust, and bartered by the rude inhabitants of them for rice, cloths, and iron. It was from them also the agula and calamdae woods were procured, with quantities of wax, honey, and ivory.

The animals of Cochin-China are bullocks, goats, swine, buffaloes, elephants, camels, and horses. In the woods are found the wild boar, tiger, and rhinoceros, with plenty of deer; the poultry is excellent, and the fish caught on the coast abundant and delicious. The flesh of the elephant is accounted a great dainty by the Cochin-Chinese. The breeding of bullocks is little attended to, their flesh is not esteemed food, and they are made no use of in tilling the land, which is performed by buffaloes. They are totally unacquainted with the art of milking their cattle.

The aborigines of Cochin-China are called Moys, and are the people which inhabit the chain of mountains which separate it from Cambodia. To these strongholds they were driven when the present possessors invaded the country. They are a savage race of people, very black, and resemble in their features the Caffrees.

It was about the year 1280 of the Christian era that the first Tartar prince became possessed of the throne of China. This revolution afforded an opportunity to the western provinces to throw off their dependence, and they were formed into a kingdom, under a prince whose descendant now reigns in Tonquin, and is called Knaw Whang. About the beginning of the fifteenth century a large body of people from these provinces, being disaffected to the government, joined under a leader of abilities; they soon became masters of the coast of Cochin-China, as far as Cape Aurilla, which lies in latitude 12° 30′ N. The Moys, the original inhabitants, retired to the hills bordering their country to the westward, where they have ever since remained. The emigrants under their conductor founded the kingdom of Cochin China. The continual wars they were engaged in with the Tonquinese induced them to build a wall on the southern extremity of the province of Ding-noi, to prevent their irruptions. Every communication by sea was strictly borbidden. In the year 1764 the country of Cochin-China was in a flourishing condition, and governed by a prince of abilities; soon after his son, whose misfortunes and fate have been briefly given in the foregoing narrative, succeeded to the throne, and anarchy and confusion ensued.

The Cochin-Chinese bear evident marks of their being derived from the same stock as the Chinese. They resemble them in their features, and most of their manners and customs. Their religion is the same; their oral language, though different, seems formed upon the same principles; and they use the same characters in writing. They are a courteous, affable, inoffensive race, rather inclined to indolence. The ladies are by far the most active sex; they usually do all the business, while their lazy lords sit upon their haunches, smoking, chewing beetle, or sipping tea. Contrary to the custom of China, the ladies are not shut up; and, if unmarried, a temporary connection with strangers who arrive in the country is deemed no dishonour. Merchants often employ them as their factors and brokers, and 'tis said the firmest reliance may be placed on their fidelity.

The habit of the men and women is cut after the same fashion. It is a loose robe, buttoning with a small robe round the neck, and folding over the breast like a Banyan gown, with large long sleeves which cover the hands. People of rank, and especially the ladies, wear several of these gowns one over the other; the undermost reaches to the ground, the succeeding ones are each shorter than the other, so that the display of the different colours, makes a gaudy appearance as they walk along.

Such are the few particulars relative to Cochin-China. It now remains to shew how a connection with Cochin-China may prove beneficial to this country. The drain of specie from the Company's settlements in India is become a matter of such serious import, that any plan which may be offered to remedy so growing an evil I have no doubt will be deemed worthy of observation. I am sanguine in my expectations that a settlement in Cochin China would conduce to that desirable end, as well as be productive of many other advantages.

Our two little vessels brought from Cochin-China to the amount of 60,000 rupees in gold and silver bullion. The Rumbold the year before also brought bullion to a considerable amount, on account of sales of Bengal and Madras cloths, opium, iron, copper, lead, hardware, and glass.

The situation of Cochin-China is excellently well adapted to commerce. Its vicinity to China, Tonquin, Japan, Cambodia, Siam, the Malay Coast, the Philippines, Borneo, the Moluccas, &c., renders the intercourse with all these countries short and easy. The commodious harbours formed on the coast, particularly that of Turon, afford a safe retreat for ships of any burthen during the most tempestuous seasons of the year.

The nations of Europe, having hitherto found it impossible to provide cargoes sufficiently valuable to barter for the commodities of China, are obliged to make up the deficiency by sending thither immense quantities of bullion; by which means it has, for a number of years past, drained the eastern and western worlds of their specie. The number of junks annually resorting to Cochin-China plainly proves how much the productions of it are in demand amongst the Chinese. These productions, had we a settlement and a confirmed influence in the country, might with ease be brought to centre with us, purchased with the staples of India and of Europe. Turon would become the emporium for them, where our ships bound to Canton, from whence it is only five days' sail, might call and receive them. It would prove a saving of so much specie to Great Britain or India as the value of the commodities amounted to in China. In a few years, there is every reason to believe, a very considerable investment might be provided.

Our trade to China has ever been burthened with enormous imposts and exactions: these, under various pretences, are annually increasing, and in process of time may become insupportable. It is an opinion latterly grown current, that the Chinese are desirous of totally excluding all Europeans from their country: may we not hazard a conjecture, that the vexations they oblige them to suffer are the premeditated schemes of this politic people to effect it? Were such an event to happen, the want of a settlement to the eastward would be severely felt; the Chinese would export their own commodities, and Java, or the Philippines, as the nearest ports, would become the marts for them. As there is no reason to suppose that our inability to procure them from the first land would hinder their consumption, we must buy them either from the Dutch or from the Spaniards. A settlement in Cochin-China will give us a superior advantage to either, both as its situation is nearer, and the Chinese are most accustomed to resort thither: at all events, there is reason to suppose it will enable us to procure the commodities of China at a much more reasonable rate than now purchased by our factors at Canton, and certainly on less humiliating terms to the nation at large. Colonies of Chinese have from time to time emigrated from the parent country, and fixed their abode in different parts of Cochin-China; these have their correspondents in every sea-port of the empire: through their means, teas, China ware, and the various other articles the objects of our commerce with China, might be imported in junks to our own settlements, equally good in quality, and cheaper, as the Chinese are exempted from the exorbitant duties levied on foreigners. Some of the best workmen might be encouraged to settle in Cochin-China; and, under direction, manufactories carried to as great a degree of perfection as in China itself.

The intercourse between Japan and Cochin-China might be renewed; and we might participate in a trade for many years monopolized by the Dutch. An advantageous trade might be carried on with the Philippine Islands, and Madras and Bengal goods introduced amongst them, by means of the junks, for the consumption of Spanish America. The Siamese and Cambodians would bring the produce of their respective countries, and barter or sell them for such articles as they wanted from Cochin-China. Amongst them it is probable a sale might be found for quantities of Bengal cloths. The lower class of people in Cochin-China are, for the most part, clothed in cangas, a coarse cotton cloth brought from China; but the preference which I had an opportunity of observing they gave to Bengal cloths, on account of their being wider and cheaper, would soon induce them to adopt the use of them. The demand for opium, already in some measure become a necessary of life to the Chinese, would increase in proportion to the facility of procuring it. The importation of it, no longer confined to Canton, but carried by the junks to every sea-port in the country, would spread the demand for this drug to the remotest parts of the empire.

But what inspires the most flattering hopes from an establishment in this country is its rich gold mines, celebrated for ages as producing the richest ore, so pure that the simple action of fire is said to be sufficient to refine it. I omitted no opportunity of making enquiries respecting this valuable article, and was told that mines were formed in different part of the northern provinces, and particularly in Hue, where the ore lay so near the surface of the earth, that it was dug up with little labour. Under the direction of a skilful metallurgist what might not be expected from such a source?

Great as the commercial advantages are, the political ones resulting from a settlement in Cochin-China would be scarce inferior.

Turon bay would not only afford a secure retreat to our Indiamen in case of losing their passage to China, but from thence we might also intercept the fleets of any hostile power, either going to or returning from that country; we should become formidable neighbours to the Dutch and to the Spaniards, and in the event of a war with either of them, attack with advantage their most valuable settlements.

Should the Company be induced to form a settlement in Cochin-China, it may be effected on principles strictly just and at a small expence. Several of the royal family, besides the Mandarins who were in Bengal, with many officers of the late Government, urged me to use my endeavours with the Government of Bengal, to induce it to afford them assistance, promising a powerful support whenever we should heartily join in their cause. To restore their lawful sovereign to the throne, would be now a measure so popular, that the sincerity of their offers cannot be doubted. To relieve an unhappy people, groaning under the weight of the most cruel oppression, would be an act worthy of the British nation. Fifty European infantry, half that number of artillery, and 200 sepoys would be sufficient for this and every other purpose. The natives of Cochin-China are infinitely below the inhabitants of Hindostan in military knowledge; I have, however, no doubt that a body of them, well disciplined and regularly paid, would prove as faithful to us, and contribute as much to the security of any possessions which we might acquire to the eastward, as the sepoys do to our territories in India; in case of any distant expeditions they would be found superior, being entirely free from all religious prejudices, and having no objection to the sea.

While Cochin-China remains in its present distracted state, a favourable opening is presented to the first European nation that may attempt to obtain a footing in the country; should the Company therefore entertain a design of forming an establishment in Cochin-China, no time should be lost in carrying it into execution.

JOURNAL OF A ROUTE OVERLAND FROM MALACCA TO PAHANG, ACROSS THE MALAYAN PENINSULA.[*]

By Mr Charles Gray.

January 2nd, 1827.—At 9 o'clock A.M. left Malacca for Pahang,—weather very bad and plenty of rain. The road or path from Malacca to Rumbiah is very bad at this time of the year. Halted at 4 o'clock on account of the heavy rains, and remained at Rumbiah all night, the most part of the land in good cultivation with paddy.

3rd.—At 6 o'clock left Rumbiah. Much rain all day. The path, which is formed by the Pahang traders, lies across different paddy fields, up to the village of Malim Kichil. From this to Naning the path is pretty good. To-night we remained at Naning and were well received by the Panghulu of that place—the land in good cultivation.

4th.—Left Naning at ¼ past 6 o'clock. The roads from Naning to the end of the Company's district are very bad, and the whole of that which was formed by Colonel Farquhar is stopped up by bushes formed by the inhabitants, to keep cattle from entering their plantations of paddy.

After leaving the Company's district, met with a good road and the whole of the land in good cultivation up to great Mount Lanjut. Crossed Mount Lanjut, and found it extremely fatiguing, on account of the heavy rains which had fallen during the last 3 days. From the village of Mount Lanjut to the village of Gadong and Tanjong the whole of the land is in good cultivation. The inhabitants seem to be kind and obliging, and I was told by them that I was the first European that ever crossed Mount Lanjut. This day crossed Mount Miko,—much rain and heavy falls of water from Mount Miko.

We remained during the night at the village of the Miko. The produce of this mount is sapanwood, dammer and canes, or what we term Pinang lawyers, in abundance. This mount is full of wild beasts which put the inhabitants in fear to look for the abovementioned articles. It is very cold on this mount, and the fall of the dew is heavy. The inhabitants say that the rain has fallen incessantly throughout this month. The paddy at Miko is preferable to that of Malacca. It is supposed by the people, that the ground there is better for such cultivation; one ganton never producing less than 100 in return, while that of Malacca seldom produces more than from 50 to 60 gantons. On Mount Miko there is a village called Kampong Kling, I was informed that it contains nearly 800 inhabitants. This village belongs to the Rajah of Rumbow.

---

[*] From the Malacca Observer, 27th February, 1827.—We find the following mention of Mr Gray in *Newbold's* British Settlements in the Straits of Malacca &c. vol. II p. 136. "An Englishman of the name of Gray (whose information is to be taken, however, with caution), is said to have been the only European who has penetrated into the interior of this state (Johole). He passed through part of it in 1827, on his return to Malacca from Pahang, whether he had performed a journey overland, across the Peninsula, to barter opium for the gold-dust of the latter place.* * * * Mr Gray met with great kindness and hospitality from the inhabitants of the different states through which he passed. He fell, however, a sacrifice to his exertions, dying of jungle fever, contracted during the journey, twenty-five days after his return to Malacca."—Ed.

5th—Left the valley of Miko and crossed mount Pabi and Panting Pahat, much rain until 12 o'clock, and the sun visible for only two hours, and seen the first time since my leaving Malacca. On crossing mount Panting Pahat, the paths are very bad, on account of the rain and heavy falls of water. There are plenty of durian and cocoanut trees on this mount, supposed to have been planted by passengers or Pahang traders who visit Malacca. In the valley of Panting Pahat, paddy is in high cultivation and fruit trees abundant. This valley was once well inhabited, but is now nearly abandoned on account of a plague, or what the natives term *hantu*. I suppose it to be the cholera morbus. From the end of this valley up to the valley of mount Passir is an excellent view of several paddy fields, to the extent of nearly 5 miles, all in a high state of cultivation.

The inhabitants are very few here, but seem to be harmless people. From the valley of Passir to that of Juno, the road is very bad, in consequence of large bushes extending over it. From the valley of Juno to the village of Pila is an extensive paddy field, of nearly 1,000 acres, in good cultivation.

The district of this place is about one day's journey and thinly inhabited.

The inhabitants of Pila are a good kind sort of people, but seem to be in great poverty. I am informed that near Mount Juno there is a tin mine, but the indulgence for working it is not granted by the Rajah, fearing that it would destroy the paddy plantations. Sapanwood and rattans are plentiful here.

6th.—At 7 o'clock A.M. heavy rain which ceased a little before 10, when we proceeded on our journey. At Pila, cattle and poultry are very cheap. To-day crossed little Mount Lanjut, and could not proceed any further than the end of Pila on account of the heavy rains which continued from 3 o'clock till 6. Passed the night at Pila.

7th.—Left Pila at half-past 7 o'clock A.M. Much rain and the roads very bad all the way to Jompol; between Pila and Jompol there is a low mountain called Dea. The path here is very bad up to Sungi Dua, where there is a small village inhabited, in the vicinity of which there is a small river formed by the waterfalls from the mountains. The river empties itself into the River Moar. The shallowest part of this river I found to be not less than four feet; after crossing near Jompol, there is a low mountain called Jusi. The road is very bad, being nothing else than total bush.

At 4 o'clock we arrived at Jompol, and remained at the master of Customs' house, whom I found to be obliging and attentive. I am informed that all the Pahang traders and other passengers stop at his house on their journey.

At Jompol there is a large tin mine, but it is little worked owing to the indolence of the Malays; sapanwood, dammer and rattans, and likewise paddy, are to be had here in great quantities.

The produce of the place is forwarded by the River Moar to Padang and from thence to Malacca.

Jompol was the last stage of my journey through the interior to Pahang by land.

8th.—Heavy rain to-day, could not leave the settlement of Jompol. During this month it is cold with heavy rains. Here I purchased a boat to proceed to Pahang.

9th.—Left Jompol with 9 men well armed for Pahang. The river of Jompol is formed by the water falling from the different mountains in the interior.

After going down the river Jompol for nearly one hour, I was obliged to cross overland with my boat and goods for nearly 300 yards, to fall in with the river Sirting, which leads to the lake of Brah, and the river Brah, the whole of which falls into the great river of Pahang. On the banks of the river Sirting, which is near Jompol, is the dwelling of the Rajah, who begged me to remain one day with him; but desirous of reaching Pahang as soon as possible, I declined availing myself of his kindness. To the Rajah for his attention in procuring me kajang, fowls, and other necessary articles I feel extremely obliged. I have been informed that the Rajah of Jompol has little or no power as a Rajah. The ruling power seems to be entirely vested in the Panghulu.

From the river Jompol, one may reach Malacca in 8 days by the river Moar.

At Jompol, there is a small gold mine, from which the Rajah derives no profit; as the miners will not be subject to any sort of duty. At 10 o'clock left the Rajah and proceeded down the river Sirting towards Pahang. At 11 o'clock we had heavy rain, which lasted until 6 in the evening. Remained during the night at a small settlement called Bahru, near the banks of the river Sirting.

10th.—This morning we had heavy rain, and could not proceed down the river until 11 o'clock. At night remained on the banks of the river Sirting.

11th.—Left the banks of the river at ½ past 5 o'clock, no rain to-day. At this time of the year, there is plenty of water in the river Sirting, on account of the heavy rains which fall in the months of November, December and January.

On the banks of the river Sirting, there is excellent timber, with dammer and rattans, in great plenty.

From the settlement of Bahru to the river Brah, there are no inhabitants, but what the natives terms Orang Hutan, or men inhabiting the woods; who frequent the river Sirting for the purpose of fishing.

Elephants are in great plenty. We never saw them, but heard them while on the river and saw their tracks next morning. To-night we remained on the banks of the river Sirting.

12th.—Left the banks of the river and proceeded towards Pahang. We had a little rain to-day and remained on the banks during the night.

13th.—Left the banks of the Sirting and arrived at the lake of Brah at 2 o'clock P.M., which the Malays called *Taseh Brah.* I believe it to be nearly 50 miles in circumference, formed by the of water from the different mountains.

The river Sirting, the lake of Brah and river Brah, falls fall into the river Pahang, which empties itself into the sea.

From the Rajah's house on the banks of the river Sirting to the end of the river Brah, I suppose to be a distance of 200 miles, as I was 5 days going down to the end of the river Brah, and having 8 men pulling a small boat with the current in our favor. On my journey down to Pahang, I suppose the depth of water to be above 40 feet in most parts, not being able to reach the bottom with a 40 feet pole. In some parts of the river Sirting and river Brah a brig might go up, and in other parts nothing but a small boat, on account of the water being above the fallen trees, so that the boat must be lifted over before it can proceed, on account of the overflowing of the banks of the river. We remained during the night on the banks of the river Brah, near which there is a large village called Kampong Brah, containing a number of inhabitants under the control of the Rajah of Pahang.

14th—Left the banks of the river Brah, and arrived at the river Pahang at 10 o'clock.

No rain to-day.—Remained on the banks of the river Pahang all night.

From the river Brah to the settlement of Pahang, the river is wide and deep in this season of the year; I suppose it to be less than 60 feet deep.

15th.—Left the banks of the river at ½ past 4 o'clock—paddled all day and night, and arrived at the village of Pahang at 6 o'clock next morning.

In the river Pahang there are 8 or 9 most beautiful Islands, covered with cocoanut and betelnut trees; but in December and January, these Islands are overflowed on account of the numerous falls of water from the interior.

16th.—Met the Rajah of Pahang, by whom I was well received. I requested permission to proceed to the gold mines, to dispose of my goods, which he refused to grant, for the following reasons;

It being very troublesome and not to be performed in less than 40 days, hard pulling.

Being a stranger and a European, some unforeseen accidents might occur, and my disposing of my goods to the natives in the interior might cause trouble.

The king desired I should be well taken care of, and put me immediately under the care of the merchants Sahid Alwee and Sahid Abdollah, two respectable merchants, well known at Singapore.

18th.—No business done, I waited to see the king, who promised to assemble the merchants next day to purchase my goods, he himself not being in any trading way.

19th.—Could not come to any terms agreeable to me.

20th.—This day sold 5 chests of opium at 800 dollars per chest, in barter for gold dust at 22 dollars per buncal Pahang; gold dust to be forwarded to Singapore or Malacca agreeable to my letter of advice; the king binding himself security for the said amount.

From the knowledge of the price of opium falling daily at Singapore and Malacca I made as quick a sale as possible.

21st.—Sold 1 chest raw silk for 305 dollars, it being damag by the heavy rain from Malacca to Jompol. Delivered 5 ches of opium to the merchants, and sold 10 balls of damaged opiun for 180 dollars to barter for gold dust at 22 dollars per buncal. This evening purchased 2 catties of gold dust.

I am informed by the merchants, that they have discovered a tin mine, near the river Leppa, at the distance of two days' pulling from the settlement of Pahang; it is expected to turn out favorably and to be opened in the dry season, by about 800 Malays, besides a number of Chinese.

22nd.—This morning left the settlement of Pahang for Malacca at 5 o'clock. Much rain with strong winds from the north—made a small kajang sail, paddled and sailed up the river Pahang; the current very strong against us.

23rd.—Paddled up the river with 9 men, the current still strong against us.

During the night we were alarmed by the elephants which were not a gun-shot from the boats.

24th.—Light rain which lasted until 4 o'clock this evening.

25th.—Much rain during the whole day.

26th.—Left the island at ½ past 5 o'clock and arrived at Chuno, which is a large village on the banks of the river Pahang.

27th.—Left Chuno at 5 o'clock and arrived at the mouth of the river Brah at 2 o'clock; much rain all day.

In going down to the village of Pahang from the mouth of the river Brah, the current was very strong in our favour, and by 30 hours pulling day and night we arrived at the village of Pahang. On returning I found it quite the contrary.

Before I could reach the mouth of the river Brah, I had nearly 6 days hard paddling with a temporary kajang sail.

The information which I received concerning the gold mines, is that from the mouth of the river Brah to the village Jelleh is nearly 12 days hard pulling, and from thence to the mines, one month's pulling. Jelleh is the village where the trade in gold is carried on.

28th.—Left the banks of the river Brah, and arrived at the lake of Brah at 12 in the forenoon; we remained on the banks Sirting during the night.

29th.- Left the banks of the river Sirting at ½ past 5 o'clock. No rain to-day until 7 in the evening, when we had a heavy shower which lasted during the night.

30th.—Left the banks of the river at ½ past 5 o'clock, rain heavy all night.

31st.—Left the banks of Sirting at ½ past 5 o'clock, heavy rain which induced us to seek shelter.

Three men were taken ill to-day with the jungle fever, which continued on them till they arrived at Malacca.

February 1st. - Remarked that during the night, the water in the river rose 2 feet by the heavy rains.

At ½ half past 7 o'clock left the banks of the Sirting.—At 10 o'clock, heavy showers of rain which lasted until the morning.

2nd.—Left the banks of the Sirting at 6 o'clock and arrived at the village of Bahru, at 8 o'clock, from thence proceeded to Jompul, where we arrived at 2 o'clock; on my arrival here, I was informed that after my leaving the river Sirting for Pahang, the Panghulu of Jompol followed me with 13 men well armed, to protect me and my property. On my return to the river Brah, to the lake of Brah, and river Sirting, I found they were very different from what they were when I passed; as in the months of November, December and January they are greatly overflowed by the extensive falls of water from the different mountains. I found the deepest part of the rivers only 20 feet or less in most parts.

I have been informed, that in the months of March, April, May, June and up to August, you cannot proceed from the river Sirting to Pahang on account of the river being almost dry, as the falls of water from the mountains are not so great in these months. Fish is very cheap up the river. For two chupahs of rice, we got as much as was sufficient for 10 men, from a sort of men termed Orang Hutan or men of the woods.

3rd.—Left Jompol at 6 o'clock in the morning; crossed mount Dea. The roads from Jompol to the valley are very bad, being a total bush; from the valley of Dea to the village of Pila the road is very good, and inhabited by good and harmless people, who are very obliging.

4th.—Left the village of Snelling, and crossed Mount Snelling, Mount Eness, and Mount Pungo; Mount Snelling is the greatest and highest mountain from Malacca to Pahang. The road or path is very good from the valley of Pungo up to Johor.

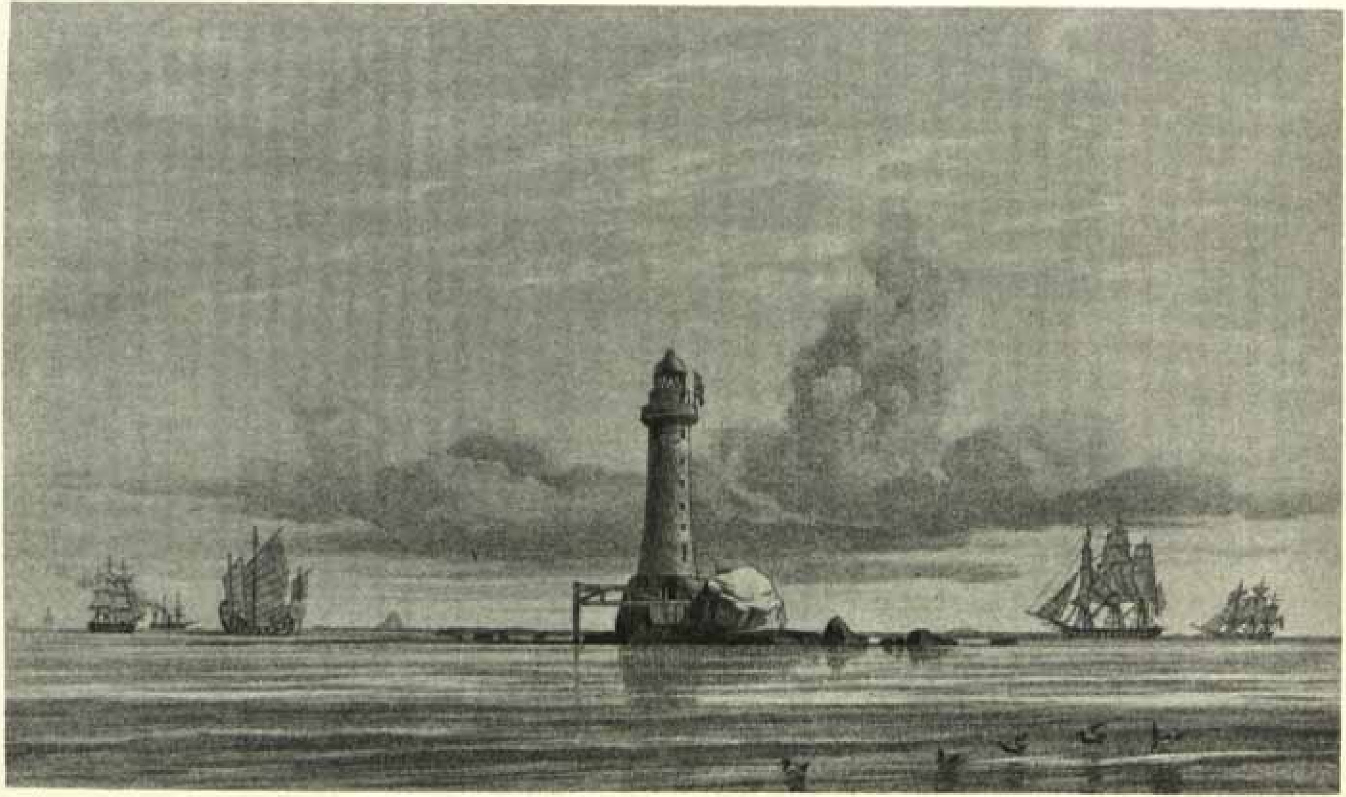
From Johor to Gumunche is one day's journey. Here there is a tin mine.

5th.—Left Johor at ½ past 5 o'clock and crossed mount Johor; from the valley to Tamping, the path is very good. At 2 o'clock we crossed the river of Malacca and mount Meachad; from mount Meachad to Sibang there is a very large wood, and we were obliged to go through it upwards of 4 miles.

6th.—Left Sibang at 5 o'clock. The road from Sibang is very good up to Malacca, where we arrived at 1 o'clock P.M.

Remarks.—When I left Malacca I had 22 men and on my arrival at Jompol I sent back 13 whom I found to be useless in proceeding to Pahang, there being no apprehension of danger. Their behaviour was very good, and they were attentive to my orders. In crossing the mountains I found it very fatiguing, owing to the heavy rains which fell during the month; whereas it would be otherwise in the dry season. We were 6 days in travelling from Malacca to Jompol on account of the heavy rain, and luggage.

The distance I suppose, from Malacca to Jompol, to be not more than 90 miles, as I was but 3 days and 6 hours, in returning. We were unable to walk fast on account of the 3 men who fell sick.


Singapore Straits.
Barbukit Hill.
Romania Pt & Islands.
False Barbukit.
China Sea.

HORSBURGH LIGHTHOUSE.

October 1851.

T. Picken, lith.

Day & Son, Lithrs to The Queen.

J. W. Richardson, 23 Cornhill, London.

THE

JOURNAL

OF

THE INDIAN ARCHIPELAGO

AND

EASTERN ASIA.

ACCOUNT OF THE HORSBURGH LIGHT-HOUSE.

By J. T. THOMSON, F. R. G. S., Government Surveyor at Singapore.

PREFACE.

THE following account of the Horsburgh Light-house, has been drawn up at the desire of the Honorable Colonel Butterworth, C. B., Governor of the Straits Settlements, as expressed before he left his Government to proceed to the Australian Colonies for the benefit of his health. In laying the same before the Government, I must apologize for the imperfect manner in which the task has been accomplished, as I am but little accustomed to express my ideas in writing, and consequently cannot pretend to illustrate the various topics and subjects, which have been thought worthy of recording, with the conciseness and perspicuity of more experienced writers.

The tower and light now placed on Pedra Branca rock and bearing the name of the eminent Hydrographer, James Horsburgh, F. R. S., has not unappropriately been erected in the half-way distance, on the route pursued by shipping carrying on the commerce of India and China, and while it will permanently guide that commerce at a place where the narrow and intricate passages of the Straits of Malacca are first entered upon in coming from China, it will at the same time stand in the midst of the scene of his hydrographical labours, bearing testimony to the high estimation in which these labours are held by the government of British India, and his countrymen sojourning in these eastern parts.

On the successful completion of the undertaking intrusted to me, which has been honored with the approbation of my superiors, I must gratefully acknowledge the great favor conferred on me by Colonel Butterworth, in selecting me as the Architect to design and carry out this important work, calculated to be of benefit to the mariner. The deep and solicitous interest which he evinced in all that concerned the progress of our operations, I trust I have responded to in a satisfactory manner, by leaving no means untried to render the work worthy of the object to which it is dedicated.

To the Honorable T. Church, Esquire, Resident Councillor at Singapore, the Light-house operations, as well as myself personally, are much indebted. To him I was throughout directly responsible, and the courteous and condescending attention which he gave to every matter brought to his notice, however minute or troublesome, and the promptness with which he sanctioned or caused to be carried out all necessary requisitions, tended greatly to the rapid progress of the works. Further, the kind assurances of his firm support and assistance when the difficulties that were first encountered almost rendered the success of the undertaking problematical, and the undeviating confidence under these circumstances with which he honored me, were of too great value not to be most thankfully acknowledged here.

In the account of our operations, the position of the Pharos is described, and the mode of its construction and other matters connected therewith detailed. I will only ask permission to remark here, that as far as I am informed, I believe it is the only Light-house in India occupying a position on a small solitary rock far out to sea, the nearest promontory of land being nine English miles distant and the nearest port thirty-seven; also, that there is only one other constructed in the same substantial manner of granite.

In the generally calm seas of the East Indian Archipelago, the difficulties encountered by reason of the elements are by no means so great as in higher latitudes, though the heat of the climate makes such works, in which constant and unremitting exposure is necessary, most trying to the European constitution, yet in a novel undertaking like this, there are other disadvantages peculiar to the country, which may not be lightly considered. These are mainly to be found in the lack of energy and *vis animæ* combined with the rudeness and unskilfulness of the people on whom we have to depend for labour, and in the absence of mechanical appliances by which in Europe all difficulties in construction are so easily and quietly overcome. Over the Chinese, especially, who are a self-sufficient race and only short sojourners in the small settlements of Europeans in the Indian Archipelago, the Architect cannot expect to have that moral influence that he would have with his own countrymen, or with natives born in British territory, nor can he expect them to face difficulties or bear unusually protracted labour without possessing such an influence. On this race, as will be seen in the following pages, we were entirely dependent for the carrying on and completion of the works on the rock, and it used to be a constant source of anxiety and trouble to foresee and plan our arrangements in such a manner as to avoid testing their endurance, for when this happened they were sure most recklessly and unconscionably to abandon their duty. These circumstances rendered the favorable progress of the works a source of fear and uncertainty at all times, until success was put beyond a doubt by the accomplishment of the whole.

PART I.

Origin of the name Pedra Branca.—Position of the rock.—Channels in its vicinity.—Tides and Currents.—Temperature and rain fall.—Winds and weather during the south-west monsoon, same during the north-east monsoon.—Description of the rock and the surface it presents for the construction of a Pharos on it.—Anchorage in the proximity of the rock.—Dangers to navigation and list of vessels lost, stranded and damaged since 1824.

The rock on which the Government determined on placing the Horsburgh Testimonial, to be erected in commemoration of the valuable services rendered to the navigation of the Eastern Seas by the late eminent Hydrographer, James Horsburgh, is called Pedra Branca by Europeans and Batu Putih by the Malays, both terms signifying white rock. No term could have been more appropriate, as the rock prior to our operations on it presented an aspect of perfect whiteness, owing to its being covered by the dung of the numerous sea-birds, that frequented it as a resting place.

The rock is situated at the eastern extremity of the Straits of Singapore, nearly in mid-channel, and as it advances beyond the mouth of the Straits considerably into the China sea, it has for ages served as the principal leading mark to vessels passing out of or into the Straits. The rock is situated in Latitude 1° 20' 15" N. and in Longitude 104° 25' 00" E. of Greenwich, according to the Admiralty Charts, and is distant from Point Romania, which is the nearest point of land, 9 English miles, and from Singapore, the nearest town, 37 English miles. From a mile inside of the former place, wood and water are procurable, and from the latter all provisions and other necessaries can only be had, as the coasts between Pedra Branca and Singapore, with the exception of a few miserable fishing villages, none of which are within 20 miles of it and whose inhabitants are well known to be addicted to piracy, are uncultivated and covered with primeval forest, which, besides being infested with wild animals, such as the tiger, bear, rhinoceros and elephant, is almost impenetrable to man, by reason of thick underwood thorns and creepers. Besides the main rock, which occupies the most northerly position, there are several other dangers within the compass of 2 nautical miles, that encumber this part of the Straits of Singapore, several of these being sunken rocks and others only shewing a few feet above the water. Between Pedra Branca and the Malay shore and lying close to the latter are the Romania Islands, which consist of 4 small bushy islets and several rocks; these afford no shelter but are to be avoided, owing to the several out-lying sunken reefs with which they are surrounded. There are three channels leading into the Straits of Singapore from the China sea. That on the north of Pedra Branca, and between it and the Romania Shoal, is the one principally used and is termed the Middle Channel. Though the soundings are deeper in this channel than the others, being from 25 to 40 fathoms, yet it possesses the advantage of being clear of all dangers, and on this side the Light-house can be approached close-to; thus when a vessel is passing through the middle channel she has only to shape her course direct to the light, and when past it, an after bearing will lead her either out or in, as her course may be, clear of all dangers.* The channel leading between Pedra Branca and the Bintang shore, termed the South Channel, is of next importance; the soundings vary from 10 to 15 fathoms and consequently the channel is more favorable for anchoring, but the numerous dangers on either side, both in the vicinity of the shore and the Light-house, seem to deter vessels from using this route, as during our two seasons' operations on the rock, we found that vessels seldom chose this channel when they could make for the middle one. The channel between the Romania shoal and islands, termed the North Channel, is also as little entered as the south one, though the anchorage ground is more favorable, being between 8 to 10 fathoms, the numerous dangers outlying from the Romania Islands rendering the navigation intricate, particularly during the night. Another narrow channel leads between the Romania Islands and the Malay Coast, but this should never be entered by vessels drawing more than 9 feet, as a rock lately discovered by the Aratoon Apcar's striking upon it lies in mid channel, with only 11 feet on it at low water spring tides.

---

* In "John Huighen van Linschoten his discours of voyages into ye Easte and West Indies" the third book consists of "the navigation of the Portugales into the East Indies" containing amongst other things "all the courses, havens, ilands, depthes, shallowes, sands, droughtes, riffes and cliffes and their situations." The 20th chapter contains "The right course from Malacca to Macau in China with the stretchings of the coasts," which was probably written so early as the beginning of the 16th century. In this chapter the channels used by the shipping of those times, are so minutely described, as to prove incontestably, that the route then known and made use of, was through the Silat Sambulan and New Harbour, which latter is termed "ye Straight of Sincapura." After conducting the mariner from thence to the "end of the land of Jantana" (Ujong Tanah) the translation proceeds, "from the points of land aforesaid lying at the end of the land of Jantana, there "runneth a riffe (Romania shoal) east north east into the sea, well two great miles "(Spanish), and when it is calm weather you cannot see the water break upon it, "only that it hath a certain white skin over it, which is presently seen and discerned and when it is rough weather then the water breaketh all over. Betweene "this riffe and the islands (Romania Islands) runneth a great channel all stony "ground, and the shallowest place that I found therein was 5 fadome and ½ and "then to 7 fadome and ½, and then again I found 6 or 8 fadome and ½ and is in "breadth about the shot of a great piece right over; if you will pass this channell "you must runne half a myle off from the islands and come no nearer to it, for if "you should you would run on ground; It were good that great ships should not

The tidal currents set through the Middle Channel in a N.E. & S.W. direction; through the South Channel in an E.N.E. & W.S.W. direction, and through the North Channel in a N.N.E. & S.S.W. direction. The currents are much affected by the prevailing

---

" pass through it unlesse they were compelled thereunto, as it happened to Fran-
" cisco Daginar that there runne on ground and was in danger to have cast away
" his shippe, because he ranne too neer the riffes and that the wind scanted; two
" myles from these islandes south south-east (query E.S.E.?) lyeth Pedra Branca,
" that is white stone, which is an iland of white stone rockes and cliffes, on the
" south side thereof on which side likewise lyeth the iland of Binton which is verie
" long, in the middle whereof there is a high houel, whereupon there is deepe ground,
" but not good to anker for such as come from China; round about Pedra Branca
" and close by it there are 6 fadome deep good ground, but you must take heed of
" the cliffes and riffes lying by it. I have already told you, that in passing through
" the straight, when you are over the sandes in the manner aforesaid, at 15 fadome
" you must sayle eastward towardes the islands, which you shall presentlie see as
" soon as you are past the river of Jantana; (Johore river) and when you begin to
" neare them, then you shall keep towards Pedra Branca, and looke that you keepe
" half a mile from it, taking heede you come not neere the syde of the islandes
" (Romania Islands) for two causes, the one because the windes at that time when
" you sayle to China doe alwaies blow off the syde of Binton, (Bintang) which is
" the monsoon that commeth out of the south south-west, and if the wind should
" scant and fall into the south-east, as often tymes in those countries it happeneth,
" being on the syde of the islands you could not passe by the riffes, whereby you
" should bee compelled to passe through the channell that runneth betweene Pedra
" Branca and the islands, or else you should spend so much time in staying there,
" and that the monsoon, that is, the tyme of your voyage to China would be spent;
" the other is that if you chance to bee there with a slow wind and tyde, or with
" few sailes spred, then the streames would drive you upon the riffes before you
" could avoyde them, as it happened to the shippe of Don Diego de Meneses whose
" pilot was Gonsalo Viera, who by the water was driven upon 10 fadome, where he
" ankered and then after he came to 7 fadome, where he spent 3 dayes by ankering
" to get out again: for the which two causes, I advise yon, to keep on the side of
" Pedra Branca or the white cliffes aforesaid."

From the above extract it would appear, that the old Portuguese pilots were as well acquainted with the channels as we are at the present day, and their instructions are such as are now found to be the safest to pursue. The Middle Channel was in those early days of European navigation in the east, noted to be the best, and Pedra Branca was its leading mark.

winds; they set strongly into the Straits during the continuance of the N.E. monsoon, and in a contrary direction during the S.W. monsoon; this is particularly the case during neap tides. It is high water at full and change at Pedra Branca at 10h. 35m. A.M. The flood runs into the Straits and the ebb outwards, but the current does not generally turn till half ebb or half flood, that is, if low water be at 6 A.M. the current will run ebb till 9 A.M., although the water be rising on the rock. At 12 noon it would be high water after which the tide would fall, but notwithstanding this the current would run flood till 3 P.M. before turning; but there are frequent exceptions to this rule, for I observed during the months of May, June and July, when the morning ebb tides fall much lower than the evening ebbs, that the current would run strong out till three hours after the tide began to rise on the rocks and then continue slack water all day; while in the months of October and November, when the evening ebb falls much lower than the morning one, the tidal current would set strong out all night and continue slack inwards during the next day. At full moon in August, 1851, I found that the perpendicular rise and fall of tide was only 2 feet 9 inches, but 3 days afterwards the rise and fall was 6 feet 7 inches, which was the greatest during these springs. In July of the same year, I found the greatest rise and fall of spring tides to be on the 3rd day after the change of moon, when the tide rose 7 feet 9 inches above low water mark. In May and June I found the tides to fall lower and rise higher than in the other months that we were on the rock, by fully 18 inches. I, of course, had no opportunity to make tidal observations during the north-east monsoon, which continues from November to April. The neap tides have only a perpendicular rise and fall of 1 foot 7 inches.

During the month of August, 1851, the thermometer in the shade stood at 78° to 82° at 6 A.M. and at noon 80° to 86°. In the open air, when exposed to the sun's rays, the thermometer rose at noon to 114°. Observations on the thermometer have not yet been had for one full year, but it may be stated that the temperature can differ little at any time from the above if we may be allowed to judge from observations taken in Singapore. It may average in December 2° lower and during June 2° higher. The rain fall at Pedra Branca appeared not to be so copious as on the adjacent coasts, for it was frequently seen to be showery on the Bintang and Malay Coasts, where the moisture is attracted by Bintang and Burbucit hills, when none reached the rock.*

---

* Since the 1st of November, 1851, to the present time, (July 1852) the indications of the thermometer have been registered twice a day. The following table shows the average results:—

From May to October southerly winds prevail, this being what is termed the south-west monsoon. At the commencement and termination of the season a smooth sea, light winds and calms prevail, excepting when occasional strong S.W. squalls, termed in the Straits of Malacca "Sumatras," come on. These squalls blow heavy for 3 or 4 hours, after which their force will diminish to a strong breeze, which may last 1 or 2 days. The months of July, August and September, are notable for their strong southerly winds, but as Pedra Branca is sheltered from them by the island of Bintang, their force is not much felt, unless when the wind draws a little easterly, at which time a considerable swell from the south-east will be driven on the rock, and which is sufficient to prevent landing on the south and east sides, and occasionally on the north and west also.

The north-east monsoon prevails from the month of November to March, and during December, January and February it blows strongest. At this season, as Pedra Branca is situated at the S. W. extremity of the China sea, it experiences the full effects of the waves created by the prevailing winds; a swell more or less heavy breaks on the rock almost without intermission, and it is consequently at most times difficult of approach; at ebb tide, particularly, when the wind sets against a strong current, in the proximity of the rock, a broken sea gets up such as no boat can live in. The swell from the China sea first sets down about the 15th of October, and we found on two seasons landing to be difficult on the 20th of the same month, but the swell does not last long and periods of comparatively smooth water are found till the beginning of December, when periods favorable for landing

	6 A.M.	12 Noon		6 A.M.	12 Noon
November	81.03	81.90	March	80.00	81.22
December	79.96	80.22	April	81.00	83.00
January	78.30	78.71	May	82.58	83.03
February	79.62	79.83	June	82.13	83.53

The little rise and fall is remarkable—the lowest fall registered having been 78° and the highest rise 84° showing a range from the extremes of only 6° but it will be proper to note, that the results may be somewhat vitiated, owing to the place not being well adapted for thermometrical observations. The following table gives a comparison between the rain-fall at Pedra Branca and Singapore:—

	Pedra Branca	Singapore
November	4.62 inches	9.31 inches
December	17.67	6.42
January	3.29	13.65
February	0.60	6.90
March	0.74	6.10
April	5.96	7.75
May	3.05	7.96
June	6.78	5.52

The first column is derived from the daily observations of the Light-keepers, the second is copied from Captain Elliott's Meteorological Tables, being the average of 4 years.

are less frequent. By the end of February the strength of the monsoon gives in, but even to the middle of April the monsoon will blow so strong for periods of several days, as to render the rock unapproachable. The rock possesses no inlets or sheltered places so that the waves break on it equally heavy on all sides; a slight sea consequently precludes a close approach to it. I may here further observe that owing to the rugged nature of the south aspect of the rock, and the numerous outlying rocks close to the landing place, a slight swell is sufficient to create broken water dangerous to boats. The north aspect of the rock is more perpendicular, and the water deeper, so that during the south-west monsoon there is seldom much difficulty in landing, but of course during the N.E. monsoon the wind and waves set heavily against this part of the rock, so that it cannot be approached at any time.

Pedra Branca, as will be seen by reference to the accompanying plans, consists of a reef of rocks, measuring at low water spring tides 450 feet in a N.E. & S.W. direction, which is its greatest length; its average breadth is 200 feet. The north exposure will be observed to consist of large masses of rock, while on the southern side small blocks, generally of 2 to 5 tons in weight, lie scattered over the more sheltered places; these have evidently been rolled from the rock to their present positions, as was proved when removing a part of them to form a landing place under the south pier, for when these were removed, I found at the level of low water spring tides, the formation not to be granite like the rest of the rock, but to consist of coral, which exposed a plain surface as if ground by the attrition of masses rolling over it. The coral would appear to me to have grown *in situ* before the decomposition or disintegration of the granite mass to which it clings had taken place, and consequently before pieces had fallen from their original positions and been submitted to the action of the sea, whose effect would be to crush the living coral and prevent its further growth, by rolling the superincumbent blocks to and fro. I will be excused this digression, as it serves to prove that blocks of so large a size had not originally occupied the position in which they are now found, and which fact, being admitted, will enable us to judge of the degree of force that the waves of the north-east monsoon occasionally exert. At low water several detached rocks will be seen to lie off the main rock at distances of 70 to 100 feet. At high water Pedra Branca has the appearance of a mere heap of boulders loosely piled together, and in their disposition taking the form of a rhomboid, whose length is 140 feet and breadth 90 feet. The rock, as already stated, is granite of light grey colour and considerable sized grain, small particles of hornblende are rather sparingly mixed with the other component parts principally of quartz and feldspar. In the ledge there were only two rocks found, amongst those that attain the greatest height, which possess sufficient surface to bear a Pharos Pillar, and the one which was the larger of the two was found merely to be a boulder, for a large open chink, which is at some places a foot in width, divides it from the rocks on which it lies, and the waves of the N.E. monsoon make their way through below it. The other rock, on careful and attentive examination, was found to be a perfectly solid mass, forming an integral portion of the solid rock beneath; there were neither chinks nor veins in it, either perpendicularly or horizontally; and though it had barely room on its surface when measured N.W. & S.E. to carry a foundation 22 feet in diameter, I determined on fixing upon it to bear the proposed structure. On its N.E. side it is divided from another solid rock of smaller dimensions by a chink, and as I found that the rock in this direction viz. N.E. & S.W. only measured 20 feet, I determined to rest part of the structure on this smaller one also. The south-west side of what may now be termed the house rock, rises perpendicularly out of the sea, and on the S.E. side it overhangs about 2 feet; this appears somewhat bold when looking at the section in the accompanying plan (see plan of Pedra Branca at high water spring tides) but practically it is not noticeable, nor does it when viewed from any direction appear disagreeable to the eye. On the N.W. side of the house rock there is a gully composed of loose masses much decomposed, and on which no firm foundation could be obtained without a heavy outlay. This gully has since been walled up and filled with earth in the hope that a few hardy plants may be found to grow in it.* The highest point on Pedra Branca attains the height of 26 feet 11 inches above H.W. ordinary spring tides, the highest point on the house rock was 25 feet 3 inches, but the top of this rock was cut off to the height of 22 feet 3 inches before commencing the building; this is the level of the vault floor. Three of the western rocks are 22, 23 and 24 feet above the same level, and the rest of the group only average 6 to 7 feet. The surface of Pedra Branca is extremely rugged, being divided by chasms, and affording little room for the erection of temporary dwellings.

The anchorage for the vessels in attendance at the Light-house, is during the south-west monsoon at about ¼ to ½ a mile to the north-east of it, in 11 to 15 fathoms, and during the north-east monsoon at the same distance to the south-west in 12 to 16 fathoms. In these positions vessels can ride without being much under the influence of the strong tides that here prevail; their boats can also approach the rock without passing through the eddies and broken water that extend a long way on either side of it, and which are extremely dangerous to small boats when there is any sea on. I had no means of taking accurate observations on the strength of the tidal currents. This is a subject generally much over-estimated by mariners. On one occasion I found that I could not pass the rock, or make any headway against the tide, in a ship's gig pulling six paddles. This would show that the current had not been less than four miles an hour, and probably nearly five, but it was an unusual circumstance and 2 to 3 knots may be stated as the usual strength of current, at ordinary spring tides, though much variation was observed in the apparent force of the tides during different months. Strong ebb tides prevailed during the mornings of the months of May, June and July, and during the months of October and November ebb tides were very strong, when they occurred during the evenings. During the south-west monsoon the floods do not run so strong as the ebbs.

---

* The sea during the north-east monsoon filled the garden with salt-water and destroyed all the plants—J. T. T. 1852.

The proximity of Pedra Branca has long been noted for its danger to shipping, and as the commerce of the Eastern settlements has encreased, so have the losses become more numerous. The following list of casualties, extracted from the Singapore journals, will serve to show the extent of these losses. It is not offered as being at all complete in its notice of minor accidents, for in many of these cases there was probably no report made to the editors. In the cases of stranding or total loss, I believe none have escaped my attention, as I carefully examined all the Singapore journals published since 1824 with reference to this subject. Between the years 1824 and 1839 inclusive, 5 total wrecks occurred; one vessel was stranded and 3 minor accidents took place; while between the years 1841 and 1851 inclusive, 11 total wrecks occurred, if we include the Metropolis, which was water-logged and abandoned by the crew, thus averaging one vessel per annum; during this period 1 vessel was stranded and 4 minor accidents also took place. It would be impossible at this time to estimate the amount of property lost in these vessels. In the Dourado alone there were 500,000 Spanish dollars sunk to the bottom; while there was on board the Sylph, when she was stranded, opium to the value of 557,200 Spanish dollars, and although most was saved, the accident to her must have created large loss to the owners of the cargo in paying for salvage, and by the loss of time, market, &c.; most of the other vessels in the list will be seen to have been large, and to have contained valuable cargoes.

LIST OF CASUALTIES TO VESSELS IN THE PROXIMITY OF PEDRA BRANCA.

Date		*Name of Vessel.*	*Description.*	*Nation.*	*Tonnage*	*Remarks.*
June	1824	....	Junk.	Siamese	..	Grounded opposite Red Cliffs, and became a total wreck—cargo partly saved, but in a damaged state. The crew robbed the owners of some opium, and other valuable articles, and made off with them.
Nov.	1826	Malabar.	Ship.	British.	..	Ran on a reef of rocks on the Bintang shore, but got off having received little apparent damage.
Dec.	1826	....	Barque.	Dutch.	..	Ran on the Pan shoal, and was assisted off by the H.C. ships Duneira and Lady Melville, which saved her from becoming a total wreck. Put into Rhio in a leaky state.
Jany.	1829	Dourado	Brig.	Portuguese.	300	Ran on rocks to the east of Point Romania, during the evening, had 500,000 dollars on board—she got off but was abandoned at midnight in a sinking state. One man drowned.
June	1830	....	Junk.	Chinese.	375	Ran on rocks near Pedra Branca, and became a total wreck.
Feb.	1835	Sylph.	Barque.	British.	304	Ran on the north-east point of Bintang, at night, and was got off at the end of the N.E. monsoon and floated back to Singapore; had 995 chests of opium on board, valued at 557,200 Sp. dollars, 993½ of which were saved, by vessels sent to her assistance. The Resident of Rhio, Mr De Groot, quickly visited the wreck, and in a most handsome manner gave great assistance and protection.

LIST OF CASUALTIES TO VESSELS IN THE PROXIMITY OF PEDRA BRANCA.

Date		Name of Vessel.	Description.	Nation.	Tonnage	Remarks.
Oct.	1836	....	......	....	..	Numerous bales of cotton were seen floating near Pedra Branca by the ship Friends.
Dec.	1836	Pascoa . . .	Ship. .	British . .	802	At evening struck on a rock outside of the Romania Islands, she immediately sprang a leak and sank in shoal water on reaching Singapore roads with all her cargo on board; the cargo was got out, principally in a damaged state. The hull was never raised and was blown to pieces by gunpowder by Captain Faber, June 1845, owing to its becoming a dangerous obstruction in the harbour.
Dec.	1839	Heber. . . .	Do. .	Do. .	450	Went on shore on the N.E. Point of Bintang at night,—became a total wreck,—the most valuable part of the cargo saved.
Sept.	1842	Henry Davidson	Do. .	Do. .	469	Laden with cotton and other cargo. Struck on the south ledge near Pedra Branca at night, got off but went down at 7 o'clock next morning in deep water,—none of the cargo saved,—2 of the crew drowned, rest saved.
Nov.	1842	Gleneira. . .	....	Do. .	360	Ran on the N.E. Point of Bintang at night and became a total wreck, a small part of the cargo only was saved.
Nov.	1844	Stork. . . .	Barque .	Do. .	329	Ran on a reef during the day to S.E. of Romania Islands and became a total wreck; part of the cargo was saved, before the vessel went to pieces.

LIST OF CASUALTIES TO VESSELS IN THE PROXIMITY OF PEDRA BRANCA.

Date	*Name of Vessel.*	*Description.*	*Nation.*	*Tonnage*	*Remarks.*
Jany. 1845	Venus . . .	Schooner.	British . .	..	Went on shore during the night on the N.E. Point of Bintang, bilged and filled with water,—part of the cargo saved—vessel became a total wreck.
March 1845	....	Tope. .	Siamese . .	..	Struck on Pedra Branca at 2 o'clock in the morning and was totally wrecked, crew got on to the rock and was rescued by a European vessel passing next day. Value of cargo 1,000 dollars, which was all lost.
Augt. 1845	Mars. . . .	Barque .	British . .	317	Struck on a rock during the day to the east of Bintang and went down almost directly in deep water. The crew only were saved. When the H.C. steamer Diana visited the wreck the top-gallant masts only were above water.
Nov. 1845	Parsee. . . .	Do .	Do . .	390	Ran on the N.E. Point of Bintang during the night with a very valuable cargo, became a total wreck, part of the cargo saved.
Jany. 1847	Johns. . . .	Do .	Hamburgh .	450	Struck on a rock to the north of the north-east point of Bintang, and went down almost immediately in deep water, crew only saved.
April 1847	Poppy. . . .	Brigantine -	British . .	160	Struck on Congalton's Car rock, to the east of Romania Islands, and remained on it for 4 hours, got off, by throwing overboard some cargo, without much apparent damage.
March 1847	Isis. . . .	Barque .	Do . .	298	Struck on the same rock,—the British brig Amelia is believed to have got aground on the same rock a few months previously.

LIST OF CASUALTIES TO VESSELS IN THE PROXIMITY OF PEDRA BRANCA.

Date	*Name of Vessel.*	*Description.*	*Nation.*	*Tonnage*	*Remarks.*
Feb. 1848	....	Junk.	Chinese.	..	Went on shore on the N.E. Coast of Bintang and was totally wrecked,—she had 117 emigrants on board who were all saved.
—— 1850	Ann.	Barque.	British.	400	Struck during the night on the N.E. Point of Bintang and bilged, cargo mostly saved.—Was got off when N.E. monsoon ceased and towed into harbour.
April 1851	....	Junk.	Chinese.	100	Struck on Stork rock during the day and became a total wreck, small part of her cargo saved.
May 1851	....	Barque.	....	..	A barque, apparently American, was seen to strike on Stork rock, but got off during the night; she struck at 5 P.M.
Augt. 1851	....	Do	Danish.	..	Struck during the night of the 11th of August on Postillon rock and lay all the 12th, got off in the evening and nearly ran aground on the middle rocks near Pedra Branca, but was warned off by the working party's lamps. Same vessel was seen aground on the Stork reef next morning but she got off during the day.
Sept. 1851	Metropolis.	Do	British.	350	Struck on a reef on the Bintang shore, got off but became water-logged, and was abandoned by the crew. She was afterwards towed into Singapore by the H.C. steamer Hooghly. Her cargo of tea totally damaged.

PART II.

Determination of the Government to erect the Horsburgh Testimonial on Pedra Branca, instead of on Peak Rock, Romania—Precaution taken before fixing on a plan—Economy studied, owing to smallness of the funds—Height of Pharos and designs regulated by the circumstances of its position—Surface of rock little decomposed—Thickness of walls of tower and diameter of rooms—Exterior of tower, how planned and what curve adopted for the Batter of wall—Specifications of construction—Precautions taken before framing an estimate of the cost of works—Class of workmen capable of carrying out the undertaking, and reasons for having a contractor bound to its completion—Necessity of having all tenders and lighters armed owing to the prevalence of piracy—Class of sailors and their duties.

I received official intimation from the Hon'ble T. Church, Esq., Resident Councillor at Singapore, in a letter dated 21st June, 1847, that the Government had determined on erecting the Horsburgh Light-house on Pedra Branca, instead of on Peak rock, which belongs to the Romania group; for which position I had furnished plans and estimates in November, 1844. The alteration of the position of the light had been suggested by the Lords Commissioners of the Admiralty; owing to Peak rock being considered by their Lordships to be situated too far within the Straits, which prevented its being a good leading mark to vessels, while Pedra Branca from its advanced position was the first object that vessels run for, and which being clear of all dangers on its northern proximity, can be approached by a direct course and closely passed. Peak rock has the further disadvantage of having several out-lying reefs, which would render it necessary for ships in making for a light on it, to alter their course as they neared it, while owing to the uncertainty in judging their distance from it during dark nights, they might in passing through the adjacent channel run themselves on Romania shoal on the one hand, by keeping too distant, or on the out-lying dangers to Peak rock on the other, by keeping too near.

Peak rock being 33 feet above the level of spring tides, is somewhat higher than Pedra Branca, and being close inshore, the effects of the sea during the north-east monsoon are not so heavy upon it. I had, consequently, after observing the action of the waves at the worst season, deemed it sufficient for the former, to have merely the lower part of the Light-house tower to the height of sixteen feet of granite ashlar, and the rest of brick work, but on being called upon for plans and estimates of a building on Pedra Branca, it was necessary to pause before deciding, as it might be fairly anticipated that the action of the waves would be heavier on its lower surface and more exposed position. I therefore recommended to the authorities, that before the coming on of the ensuing N.E. monsoon, brick pillars should be erected on various parts of Pedra Branca, in order to test the force of the waves, and this was accordingly done on the 1st November, 1847. On the 1st March of the following year, I proceeded to Pedra Branca to examine these pillars and found all those erected on the north side, some of which were 13 feet above the level of the sea, entirely swept away. Those on the highest part of the rock and fully exposed, I found had their plaster knocked off on their north exposure and the mortar washed out of their joints to the depth of an inch, whilst those that were placed in sheltered positions on the south of the rock remained perfectly entire. From these facts I concluded that during this one season no breach of the sea had gone over the rock, but that a considerably heavy spray must have fallen on the highest part of it, with sufficient force to injure any brick building that could be constructed, and as we had only the experience of one season on a subject which it would require observations for many years to elucidate, as there may only be one heavy season in the course of 20 or 30, I deemed from the facts already gathered that it would not be prudent to erect in this position any edifice, whose outer walls were of less substantial materials than granite, set in the best hydraulic cement. This necessarily involved much greater outlay than what would have been required for a brick building on Peak rock, and, as I was aware that the funds at the disposal of the authorities at that time were by no means sufficient—in designing the plans I found it necessary to exercise the most rigid economy, both in regard to the extent and altitude of the building and the nature of materials, when these were not essential to stability, in the hope that the estimates might not present so great an excess, as to prevent the work meeting the sanction of the Government.

The altitude of the building was determined by the distance of the dangers for the avoidance of which it was to serve as a guide, and to have made it exceed this, however desirable on other accounts it might have been, would have risked incurring such an outlay as to debar the works being undertaken. To seaward the most distant are the Postillons rock, which is 10¼ nautical miles, and North Patch distant 10¾, and, towards the Straits, the Crocodile shoal, distant 11¾ nautical miles. If the light could be seen from the deck of the ordinary class of mercantile vessels 3 miles further than the most distant of these, viz. 15 nautical miles, I considered that all the requirements of navigators would be satisfied. The height of the masonry above high water spring tides was consequently fixed at 92 feet, which would make the centre of the light about 95 feet.* This point being determined, the next consideration was the form of building or buildings to be adopted for the position, which includes not only the structure to bear the light, but dwellings for the light-keepers and establishment, with room for stores, water and provisions. It is the most approved practice in modern Light-house engineering, to erect accommodation for the light-keepers separate from the tower or pillar that carries the lantern, for, notwithstanding the greatest precautions are adopted, the minute particles of dust that always imperceptably fly about the rooms of dwellings, penetrate to and affect all other parts of the same building, and which falling on and covering every article cannot but act prejudicially on the delicate apparatus now used for Light-house illumination. This renders it desirable that the tower or pillar should be devoted to the one purpose of bearing the lantern, machinery and apparatus. But in the position of Pedra Branca, an object more important than this seemed to consist in the safety of the light-keepers from attack by pirates and other evil-disposed persons. Its solitary position and great distance from inhabited places, might, were this point not attended to, have subjected the establishment to molestation, not only from the sea tribes of the immediate vicinity, who are notorious for their piratical propensities, but from the Chinese junks which in numbers annually commit depredations on all they think they can safely attack. This will be better understood by reference to the accompanying extracts from the "Singapore Free Press" regarding piracy (see appendix II). It may be noted that probably only half the acts of piracy come to light, for the Malay pirates have no compunction in murdering all their victims to destroy all traces of evidence against them. Under these circumstances I considered that a tower having accommodation for the light-keepers, with room for stores, provisions and water for 6 months, would be the most suitable for the position; this tower to be entered by strong doors reached by a ladder, which could be drawn up inside when necessary, to prevent access. This plan, it appeared to me, would amply suffice to deter any class of natives from attacking the building, and as the establishment now consists of 8 men with fire arms for each there can be no fear of their not being able to resist any attempt made against them. As already mentioned in Part I. the only perfectly stable rock belonging to the group allowed a circle of not more than 22 feet in diameter to be traced upon it; to this dimension, therefore, was confined the diameter of the tower at its foundation.

---

* The centre of the light is now 96 feet 9 inches, 18 inches of height having been added to the light-room wall—J. T. T.

It may here be noticed that the rock shows no signs of decomposition beyond an inch from its surface, the more exposed and decayed parts exfoliating and falling off at this distance from the sound core. The full breadth of the rock could therefore be taken advantage of, by setting the face of the ashlar masonry within an inch of the perpendicular sides.

Having determined the altitude of the light and diameter of the base, a tower with an appropriate capital was sketched. The courses of masonry were to be each 1 foot in height; to the capital and to the light room wall I assigned 10 feet, but this was increased afterwards by 1 foot 7 inches to suit the lantern and machinery, designed and constructed under the superintendance of Alan Stevenson, Esq., the Engineer to the Northern Light-house board. From the 1st course, which was on a level with the highest point of the rock, to the neck of the tower there were 56 feet, but as the top of the rock was cut off 3 feet below this point there were 3 under courses, which made in all 59 courses for the shaft of the pillar or tower, exclusive of foundation courses, that were stepped into the rock but none of which were carried round the whole circle. The lowest bed of the foundation is 16 feet 9 inches above high water ordinary spring tides, and 5 feet 6 inches below the first complete course. The diameter at the top of the shaft I determined should be 16 feet, this gives a batter to the wall of 3 feet between the 1st course and the 56th. The rooms have a diameter of 11 feet, which is found to be quite large enough, though a less diameter than this would cramp the accommodations; this made the walls 2½ feet thick at the top, and 5½ feet at the 1st course. The structure might no doubt have been strong enough with less thickness of wall, bound together as it is by strong bands of iron, but in a work of this kind, which is intended to last for ages, it, in common with other public buildings devoted to purposes essential to the wants and well being of society, should not be confined to the point of being barely strong enough, but should have all the character of stability and permanence, as typical of the extensive beneficial purpose to which it is devoted.

The next subject requiring attention was the exterior of the shaft of the tower. If the slope of the face had been in a straight line from top to bottom, the shaft would have formed a truncated cone, but the plan of this, on being drawn to a scale, presented a stunted appearance, by no means pleasing to the eye, and as I was constrained, by circumstances already stated, to certain dimensions which could not be departed from without infringing prejudicially on the internal economy of the building or increasing the size and cost of the building itself, it appeared to me that a curve should be adopted, applied convexly towards the axis of the shaft, whose lower portion should fall inwards somewhat rapidly at the base and less so at the top. With the view of selecting a curve fulfilling these conditions, I examined the three conic sections and circle to see which of them would answer best. The adoption of a curve, whose elements could be accurately calculated from given data, would also be of the greatest service to the works in setting off the dimensions of the courses to the stone-cutters and in constructing the models for their guidance. On reference to the accompanying tables (see Appendix I.) it will be seen, that the Parabola applied with its axis on a level with the top of the shaft at right angles to the axis of the tower, at the given distance, is the best adapted for our purpose. I at once rejected the same conic section, as applied with its axis parallel to the axis of the tower, owing to its too rapidly curving at the base. The same objection applied to the Ellipse, an arc of a circle, gives a curve with scarcely an appreciable difference from the curve of the Parabola, but the latter is preferable owing to its easy and short mode of calculation. The rectangular Hyperbola revolving on its asymtote, will be seen to generate a column too near the form of a cone to be adopted here. The same conic section applied with its axis minor parallel to the axis of the tower at the given distance, has scarcely an appreciable difference from theParabola. Having decided on the form of the tower and the nature of the materials to be used in it, the mode of putting them together was next to be considered. This may be shortly stated as follows, as extracted from the specifications drawn out before the building was commenced, noticing at the same time such alterations and additions as have been made thereto :—The entire building was to be faced with granite ashlar work, squared and smoothly dressed, the beds and joints being set in cement. The rock was to be stepped where necessary to receive the foundation courses. The height of the courses was to be one foot each, and their depth inwards not less than 10 and 14 inches alternately; every third stone was to be a binder, reaching nearly through the wall. All beds were to be cut square and level, without hinde or hollow. The balcony floor stones were to be five feet long and one foot broad each at their outer ends, and tapering to the centre of the tower. The walls of the light-room and the balcony parapet were to be constructed entirely of granite, smoothly dressed, each wall was to be 9 inches in thickness, but the light-room wall was eventually constructed with a thickness of 15 inches, and the parapet with a thickness of 5 inches. Out-offices were to be constructed of squared granite outside the tower, on convenient places on the rock. All stones were to be 3 to 4 feet in length and to break joint more than one foot. The inner part of the walls of the light tower and the vaults were to be of brick, set in common mortar, composed of 2 parts lime, 2 parts sand, and 1 part laterite earth, but the vaults have since been constructed with bricks, entirely laid in the best Portland cement, in which equal parts of sand and cement were used. Iron bands were to be laid, encircling the inner part of the tower wall, nearly in the centre of the wall and behind the springing of each vault. The bands were to be of inch and a half square bar iron, in three lengths, strongly bolted together at their joinings; iron bands of 1 by 2½ inches scantling have been also let into grooves cut into the 59th course, and the stones of the balcony floor under the light-room wall. These bands were grouted with pure portland cement. The parapet was bound together with iron joggles, fixed in the centre of the masonry, and the highest course of the light-room wall had its blocks, checked one into the other. Where metal was used either for cramps, eye-bolts or railings, exposed to the atmosphere, copper was the material to be put down. Partitions were to be built of half a brick in thickness, set in cement, between the rooms and the stair-case, thus each room was to be made private. No wood-work was to be put into the building, excepting for the doors, windows and ladders, shelves and furniture. The building is therefore fire-proof. All wood-work was to be of the best marbow, a species of wood when used for household purposes equal to the best English oak. The stair-railings have been executed of brass. Brass-plates have also been screwed to all the tread-boards and door-sills, though not mentioned in the specifications. All the room floors were to be paved with square granite flags set in cement.

Before framing the estimate of the expence of the works, I took the precaution to have some blocks of granite cut at the rock and wrought under my own eye. This was necessary, as there was no experience in prior or similar works to guide me, there being no edifice in the Straits of which granite has been the principal material used; where this material has been employed it has been confined to tomb stones, door sills, flags, and for other minor purposes. The Horsburgh Light-house is therefore the only example of granite masonry in these parts. The expense of cutting and dressing granite will be given hereafter.

The only class of natives capable of carrying out an undertaking of this kind are the Chinese, who are almost the only artificers in the Straits, to them therefore I was to look for the carrying out of the design. Compared with other classes of Asiatics in Singapore, they are of more independant bearing, and their superiority to them induces a self-sufficiency which in coming under the guidance of Europeans begets a stubborness not easily at all times to be overcome.[*]

---

[*] I should have wished to have given some account of the different kinds of artificers employed at the Light-house, and their tools, but the subject would require too much space and too many illustrations to be fully discussed here. I must therefore content myself with short extracts from my notes, and the illustrations, of which I have a considerable collection, must be left out, as the lithographic art in Singapore is not yet equal to the task of copying them.

The principal artificers employed were Stone-cutters, Carpenters, Bricklayers, Blacksmiths, Plumbers and Brass-founders; they were all Chinese, excepting the last, who were Javanese and Malays. It may with truth be said of the whole of these, that they are in no way equal to the artizans of Europe, but the Chinese under tuition and training may be made quite equal to the less educated of their western brethren. To describe them as we find them, it may be observed generally of them, that while they will finish smoothly and neatly, in a manner to satisfy the unpractised eye, yet their work will not bear the test of the plummet, level or straight edge, and until well drilled, the Chinese have a great distaste to the use of these instruments. In all their constructive operations, from the building of a temple to the making of a door-latch, this absence of correctness will be found to pervade the whole, their joinings and fittings are made close, less by geometrical rule and correct workmanship, than by patient trials. When we judge of their works in the higher departments of art by the standard of European taste, they may be said to be devoid of æsthetic feeling. In their compositions they delight more in furnishing curious and grotesque embellishments for the component parts, than in producing a harmonious whole. Their public buildings are not to be viewed from the outside, or from a distance, for from thence will only be seen low walls, disjointed roofs, and painfully bending ridge pieces and rafters; they must be viewed closely

Their monosyllabic language, so greatly at variance to the genius of those of Europe, makes it difficult of acquisition. The various dialects also differ from each other so much, as to be perfectly

and by piece-meal, if the observer would wish to understand the spirit of their Architecture. In the same manner their furniture and househeld-ware are heavy and clumsy, though in many cases highly and carefully decorated; lightness and elegance are not to be found in their designs or workmanship.

But to proceed with our subject, the equipments of the Chinese stone-cutters are not numerous, and there is some difference in the form of the tools of the different tribes, but it will suffice here to enumerate those of the Kay tribe. The mallet is a round piece of iron, weighing from 5 to 7 lbs. (according to the strength of the owner) with a hole through the centre in which the shaft is stuck. The chissel is an octagonal piece of iron, about 10 inches long and 1½ inches diameter, rounded at the top and pointed at the bottom, steeled at either end. The bellows is a long wooden box having valves at either end, in which a piston works backwards and forwards, on being pushed and pulled; air pipes from both ends lead into a common tube pointing into a hollow below the fire, from whence the air escapes upwards, first through a small iron grating, and then through the interstices of clay balls laid over the grating, directly under the charcoal. The anvil is a small cube of iron let into a stone sunk in the floor. The hammer for fashioning the tools has its shaft fixed into the upper end of the iron *mall* and not in the middle as is the case with the European one. There seems to be an object in this, for owing to the peculiar mode of sitting at the work over the anvil, which, as stated before, is on a level with the floor, less stooping is required with a hammer of this description than what would be necessary with ours. The tool mender sits on a stone and seldom moves from thence, his assistant pulls the bellows.

After the tools have been got ready, the first operation is to split the rock, from whence stones are to be procured. This is effected by cutting out a row of holes into which thick short wedges of iron are fitted. These are driven down by a large sledge hammer, whose shaft is also inserted at the top of the iron *mall* in the manner of the tool hammer. On a block of stone being procured of the proper dimensions, it is carried to the shed and roughly blocked out to the required size; it is then set on its edge and at either end a plummet is applied, by the indications of which marks are made at top and bottom in the perpendicular line. The points marked are then joined by a straight line drawn by a string soaked in China ink, or sometimes charcoal mixed in water. The two ends are thus rendered *out of winding*, and are ready to be commenced upon by having draught lines cut by the pointed chissel. On the draught lines at the end being dressed and proved by the *straight edge*, the sides are commenced upon, being marked by the string as before. On all the sides being dressed, the included space is now commenced on, and wrought down to a plain surface, this is done by the hammer and pointed chissel, in no systematic manner, the operator attacking at random all protuberances till brought to a level, with the enclosing draught lines; for this purpose he sits on the top of the stone, the side on which he is working being placed perpendicularly, on this he always works downwards. If the stone is required to be dressed smooth, a chissel is used with a flattened point about ¾ of an inch in breadth by ¼ inch in thickness, whose upper end is fixed into a thick rattan bent round and meeting behind which serves as a handle; this is held in both hands and the side of the stone to be so worked is now laid horizontally, at which the stone-cutter pecks till he is satisfied with the job; for this purpose he applies the straight edge which detects all hindes and hollows. On the first side being finished the opposite one is commenced upon; this is laid off by measurement across the block from the draughts of the side already dressed. Should much material require to be broken off, this is done by cutting small holes along the line to be severed, into which small wedges are driven until a rupture takes place. If only a little requires to be taken off, this is effected by chipping the pieces off by the sledge hammer. The *chipper* or *pincher* mentioned by Stevenson (see account of Skerryvore Light-house, page 123) is not known to them. The edges being thus roughly formed, the stone-cutter proceeds with the side in the same manner as described before, which being finished the ends and face are commenced upon, being marked out by *set squares* or *templets* as may be, according to the form required.

In the working of granite the stone-cutter accommodates himself to his work, unintelligible to the separate tribes frequenting Singapore. This circumstance renders their study a discouraging task, for on mastering one you find that it will only be understood by a small

and in doing this he places himself in many postures; sitting on his heels or squatting, is the favorite position, and the one which comes most easy to him, but at times he sits on the floor, at others he works with the left hand under the thigh, sometimes he crouches so as almost to be doubled up.

The Chinese stone-cutters of Singapore are wholly unacquainted with the Malayan language, and the Chinese being unknown either to myself or assistant, the management of about 100 men of so rude a class may be imagined to have been anything but easy. We were forced to reject much of their work until they found out that none but that which was correct would be passed. Their method of getting the first surface of the stone *out of winding*, as above described, is by no means so correct as that of the English workman, in which two parallel sided rules are laid at either end of the block, thus enabling the eye of the workman to detect any departure from a true plane. In a work which was to employ the Chinese so temporarily, it was useless to attempt any material alterations or additions to the tools made use of from time immemorial by them, indeed these trials should always be cautiously made, as experience often shows that the native has chosen those best suited to the climate and his constitution; the heavy tools of English workmen might in the torrid zone be wielded for a short time but not continuously. One simple instrument was introduced with great success, viz. a guage, called technically a *grippers*, which I had made after the description given by Stevenson, (see account of Skerryvore Light-house, page 124)—the value of this instrument the Chinese at once assented to, and though formerly unknown to them, readily adopted it. A good stone-cutter earns in Singapore 9 Spanish dollars a month, or 15 pence a day of English money.

The Carpenters and their tools come next to be described. In this branch of industry, the observer will not fail to remark by what opposite means the same ends are accomplished. In no respect do the Chinese mechanics differ more from those of Europe, still in this they excel so as nearly to equal them, unless in the higher branches of cabinet work. The carpenter's bench is a long narrow form having a considerable inclination from one end to the other. On this form he places his work and either sits on the work or the form as is most convenient to him. His *plane* is distinguished from the European one by being smaller, having no handle on the top and no covering blade to the cutting tool. He holds the instrument with both hands, and pushes it directly before him, with his hands applied to a small horizontal cross piece, which serves as a handle, and projects on either side about 3 inches. The axe is wedge-shaped, short in the blade and heavy. The saw is a narrow band of steel toothed on one side; this is fastened at either end into a light wooden frame composed of a wooden stretcher, into either extremity of which two end pieces are mortised, the saw is secured to these on one side of the stretcher, while a twisted rattan, or strap of iron is tied to the other, which either by twisting or wedging hold the saw rigidly extended. The blade of the saw is held at an angle oblique to the plane of the frame. The large saw for cutting up timber is on the same plan, and blocks of 2 feet in scantling are sawn by it held by only one man, who is mounted on the top of the block. They have no pit and the racks are not raised more than 3 to 4 feet above the surface of the ground. Where the saw cuts they keep a cup of water, which constantly drops a little of its contents on that spot, by means of a piece of overhanging cotton. Smaller pieces of timber they cut up by securing them in a stout square frame, by means of a batten held fast against two *cleats*. Blocks of 3 feet scantling they saw by placing them on end, in which position two men saw the wood downwards at right angles to the grain. For boring small holes they use neither pricker nor gimblet, but invariably a drill turned by the string and bow; this is an excellent method, as the wood is never split in the operation and a clean round hole is bored out. In drawing a line they use a string soaked in water blackened with China ink. The string is wound round a sheave turning in a small box, which also contains the pigment in a small compartment filled with cotton; this cotton prevents the loss of the liquid by absorbing it. Through the cotton the string is drawn when a straight line has to be marked. In the management of this instrument the Chinese is very expert;—sitting on the top of the board he clasps one end of the string with his toes which he stretches out to the point desired, while at the same time, his left hand takes the other to the opposite point, leaving his right hand at liberty to pull body out of the whole Chinese population. As the Chinese themselves pick up a little of the language of these parts, viz., the Malayan, it becomes scarcely worth the trouble for Europeans to endeavour to acquire any of the Chinese dialects, as the little

the middle of the string and let it fall on the plank. His toes are made of extensive service in this manner, as well as for holding fast on the bench any little articles on which he may be operating. In carving he will remain perched on his narrow form all day, sitting on his heels, and holding with his toes at all angles the boss, flower or other ornament upon which he is busied. His chissels are shorter than those of the English, they differ further in being tapered to the edge from either side of the blade, but in Singapore those of Europe manufacture are in much request by him. Their augers are also being supplanted by those of Europe, and the adze used by them I have always noticed to be English.

In comparing their mode of working with that of Europeans, the most distinguishing characteristic is in their sitting at their work, instead of standing to it, and in their suiting themselves to the positions of the work instead of making the work conform to theirs. It is not difficult to see that there are good reasons for these anomalies. The pliant limbs and lightly clothed and half-naked bodies of the Chinese make the mode which we find them to follow the best adapted to their circumstances. The debilitating heat of the climate also forces them to assume such postures as are most easy to their physical state. Under the equator, this is studied better by sitting than standing. These positions no doubt would be highly constrained and tiresome to the sturdy-limbed, thickly and tightly clothed European, and such being the case, each has adopted that mode most suitable to his condition; whence the differences. A good carpenter in Singapore earns 9 Spanish dollars a month or 15 pence a day.

Of Bricklayers little need be said; their tools are few and they differ little from those of other countries. Here the trades of plasterer and tiler are always combined with that of bricklayer. The trowel is exactly the same as the English, also the level and plummet, but in carrying forward their work, there are considerable differences. The scaffolding is constructed with spars, bound together with rattans, neither nails nor ropes being put in requisition. For the *hod* for conveying the lime they have a substitute in a small basket, which is drawn up by a string with a hook at its lower end. The bricks are got up to the work by throwing two at a time from one to the other, the men being placed at different heights till the top is reached. The bricklayer earns 12 Spanish dollars a month or 20 pence a day.

Of Blacksmiths there is not much to observed, further than when employed on daily wages, they can turn out good rough work, but they do not finish in the neat and careful style of the European. Their furnace and bellows are the same as those of the stone-cutters, only placed a little higher. They always stand to their work and in Singapore the better class always have in use English anvils, hammers, files and other implements, though they have also all these of a construction peculiar to themselves, which only differ so far, in being more rude and inefficient. Two men are employed at one furnace, viz., the Blacksmith and his assistant, the latter pulls the bellows and strikes with the sledge hammer. The wages of a good Blacksmith in Singapore are 15 Spanish dollars a month or 25 pence a day.

Plumbers are principally employed in furnishing small household articles in use amongst their countrymen, such as teapots, tobacco boxes, tea cannisters, &c. In house building, where gutters and pipes are required, they are totally incapable of executing the work in a manner to be relied upon. Their wages are the same as carpenters.

Malay and Javanese Brass-founders. The implements of this class are rude in the extreme, but are found quite sufficient and effective for all the purposes to which brass is applied by the native population. A brass foundry is generally constructed under a shed, roofed with leaves of attap (a Palmite), measuring 20 feet square a little more or less, on one side is placed the furnace which is composed of a hole 3 to 4 feet square and 2 to 3 feet deep, this is rudely cased round with bricks, set in clay as a mortar. On one side of the furnace are two long boxes, placed upright, divided from the chamber of the furnace by a thin wall of brick. These boxes serve the purpose of bellows and are very simple in their construction. They are open at the top; a square piston, made of wood and wrapped round with coarse cloth to render it partially air tight, is worked up and down in each box, which intercourse that takes place between the two races can thus be carried on through the Malayan tongue. Under these circumstances, the habits and ways of Chinese are little understood by Europeans, and consequently they are the less easily subjected to

---

propels the air into the furnace, through a small hole at the bottom of the box, 2 inches in diameter, placed opposite another hole pierced through the thin brick wall, from which it is distant about 4 inches. The piston has no valve in it, but the air is drawn into the vacuum, from the same hole that directs the current into the furnace. The communication between the bellows and the furnace is not by a continuous pipe, but an open space of some inches intervenes between the bellows and the furnace, the blast is consequently not strong. The fuel that is used in the furnace is charcoal. The metal subjected to the fire is melted in pots of coarse earthenware, composed of fine clay, these pots are cylindrical, open at the top and rounded at the bottom, a small mouth piece is made at the lips for the convenience of pouring out the liquid metal, this is a mere indenture on the circumference of the rim of the vessel.

The pots measure 6 to 7 inches in depth and 4 to 5 inches in internal diameter. When the metal is quite melted, these pots are laid hold of by iron tongs and conveyed to the moulds prepared to receive the liquid.

In large castings the contents of many of these pots are poured into the moulds. The moulds are prepared in the following manner:—A model of the object to be cast is constructed of wax; in small castings wax alone is used, but in large castings, in order to save this material and stiffen the model so as to preserve its form, rods of nibong (a palm) are introduced into the centre, so that the circumference and projecting parts are only composed of wax. In flat models the wax is beaten out on a flat board, and in round ones the model of wax is turned on a rude lathe either by the hand or by means of a rope attached to a long spar acting as a spring. After the model is prepared in wax, it is first cased round with a thin composition of charcoal and clay, beaten to powder and mixed with water, of ⅛ of an inch in thickness, another case is added of clay mixed with sand ½ an inch in thickness, then strips of hooping are laid along the circumference of the second casing, which are bound with wire or hoops; this finished, another coat of clay and sand of ¾ an inch to 1 inch covers the whole, the mould is then laid out to dry. After it is sufficiently dried, it is placed over a slow fire, during which process the wax is run out into a vessel placed to receive it. When the wax is all out the rods of nibong are also withdrawn, and the mould is now ready to receive the melted brass. After the brass has been received into the matrix and cooled, the mould is broken off and disengaged from the article, after which it is ready for the hands of the brazier to be polished.

In the finishing of their brass work the Malays and Javanese show no idea of correctness. Straight surfaces they merely file, as directed by the eye, round surfaces are turned in a spring lathe driven by the foot of the artizan or by the hands of an assistant. The articles produced are sometimes grotesque in appearance, and always rude in their fittings and finishings. Though considerable care is expended on ornamenting the household articles, intended for wealthy families of these tribes (who are few), they possess no symmetry nor are they founded on geometrical figures.

The Malay and Javanese Brass-founders are considerably in advance of the other native artizans of their tribes. They cast and prepare for the market meriam (cannon), lela (small cannon), pamoras (blunderbusses), prioh (pots), chereh (kettles), kaki lilin (candlesticks), tampat seree and chambol (seree boxes and their compartments), hinsil (hinges), tampat luda (spittoons), kandang jawi (rails), capi (sheaves), &c. Their largest castings do not exceed 15 piculs or 18 cwt. The brass made use of is principally obtained by mixing old copper sheathing with pig lead. Cannon that are cast with the maker's name upon them, sell at the rate of 45 Spanish dollars per picul (133⅓ lbs), if without the name at the rate of 27 Spanish dollars; these last are of inferior description but find a ready sale to the Dyaks of Borneo, who at certain seasons frequent the port of Singapore. All large castings agreed for without finishing and polishing cost 30 Spanish dollars per picul. Small articles finished and polished are sold at 70 cents a catty (1⅓ lbs). The smallest articles such as chombol sell for 2 Spanish dollars a catty.

The Chinese Brass-founders operate in a different manner to the Malays an Javanese. Their furnace has no bellows, but is heated by split wood and charcoal; they merely place the earthen pots containing the brass to be melted on a fire of these materials. There is little or no smoke in their furnace, so that no chimney is required.

controul. For a work which would engage 100 to 150 of them at a time, 40 to 50 of whom would require to place themselves under European guidance, confined for months to a small rock, situated at a distance from land, I considered that it would be more

---

The models to be cast are made of wood. If the casting be a large one, they imprint the form of the wooden model on fine clay well beaten down, in the following manner:—A box is prepared of a size to hold the model and in this fine clay is placed even with the brim; they then place the model upon it and press it into the clay as far as its middle, they next ram the clay well down and scrape it quite smooth and even, this done they sprinkle fine sand over the clay so as to create a plane of division between the upper and under part of the mould. On this being accomplished, they fit a frame board above and all round the under part of the mould, which they also fill with clay and ram down with great hardness over the model. After it is sufficiently beaten to be quite firm and consistent, the upper frame with the earth contained in it is removed from off the under one, from which it divides at the vein of sand. The wooden model is now removed and the upper half of the mould is refixed upon the under half and the matrix thus formed between them is ready to receive the melted metal.

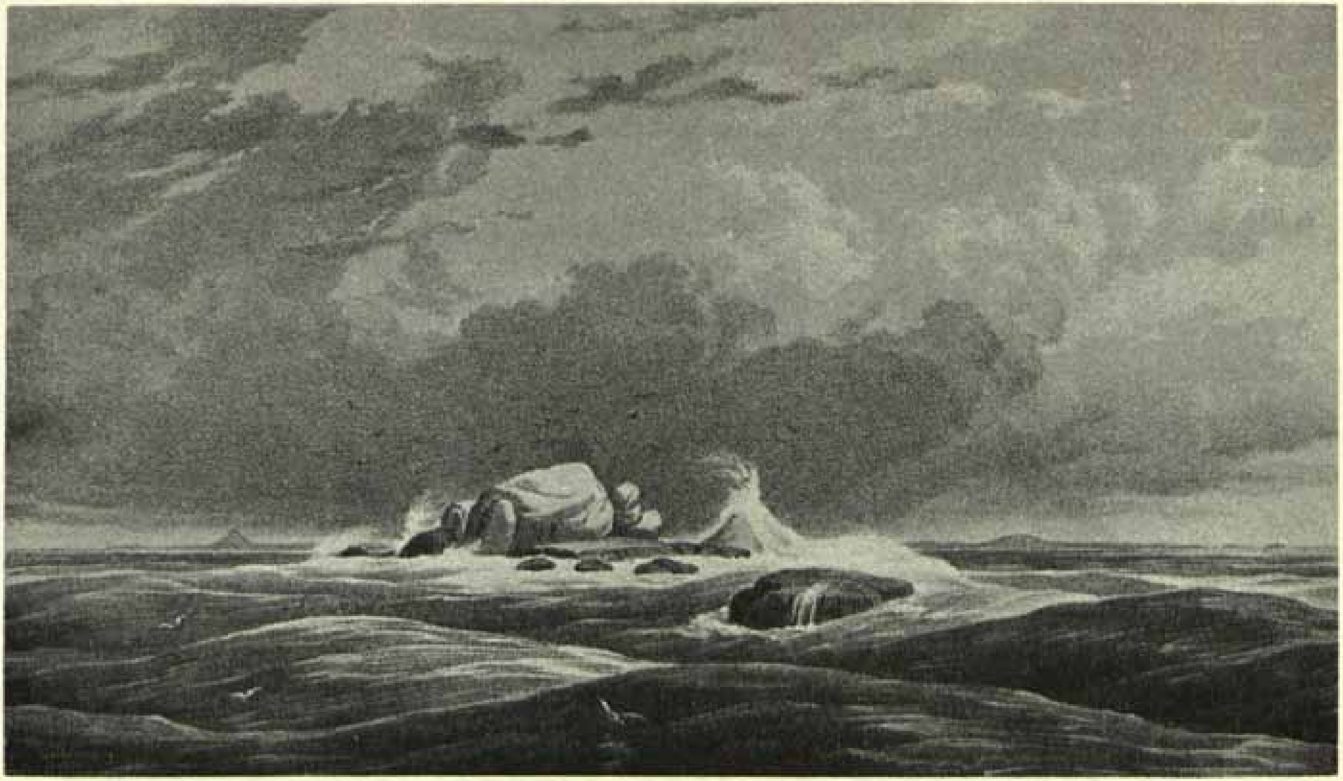
In small castings considerable ingenuity is displayed. I examined several moulds for casting chest handles, in each of which the matrices of 2 handles, 4 washers and 8 screws were contained, these moulds were about 4 inches by 5 and were prepared in the following manner:—The moulds were first filled half full with fine clay which was pressed down even, the models of the articles to be cast were then laid in different parts of the mould distributed in the most convenient manner, which being done they were covered over with clay, this was beaten down over them very hard till the whole had become quite firm and consistent. The clay mould containing the articles was then removed from the box and split in two by a knife inserted into the middle of one of the edges, thus dividing the mould in two, very nearly in a plane, bisecting the centres of the matrices of the articles to be cast, such little roughnesses or irregularities that there were in the bisection assisted in fitting the matrices of the mould together again correctly. A hole in the centre of each mould had been left by inserting a small cylindrical piece of wood, so as to pierce quite through it, from this hole channels were cut out to each of the matrices, so as to carry the melted liquid to them on being poured down. In this manner 20 or even 40 moulds can be made containing the matrices of various little articles and as they are all formed out of the same box or exactly similar boxes they fit fairly one on the other. These are carried to the furnace room and piled one on the other, with their centre holes forming a common perpendicular channel for the liquid brass to enter the matrices in each of the moulds, first the lowest one, then the next and so on as the centre passage is filed up, to the highest.

The Chinese brazier finishes his work in by no means a masterly style. His native articles are grotesque and curious but though sometimes finely and carefully worked, they display no accuracy. Where correct work founded on geometrical figures or principles is required to be executed, he is totally incompetent to the task. In general the workmanship is very coarse. The Chinese brass-founder is content with somewhat less charges than the Malay or Javanese. For all orders he requires a model in wood, before he will undertake the job, or contract for the price of it. I have never been able to make the Chinese understand a section drawn on paper.

The indigenous people of the country, the Malays, are little addicted to the mechanical arts. During a fourteen year's residence in the Straits settlements, I have only met with one Malay blacksmith and he was working in the manner so correctly described by Dampier 170 years ago, that I need only refer my reader to that author —(See his voyages—vol. I, p. 332). The only difference that I remarked was in the bellows piston which instead of being a bunch of feathers as there described, was a circular fan of feathers very ingeniously put together and affording a strong blast. The Malays occasionally build houses of plank for themselves, but as workers in wood their attention is principally drawn to boat-building. Their sampans are famed over the world for swiftness. In this line the tools used are few and simple, consisting of the *bliong* which can either be used as an axe or an adze, the *parang* (chopper), the Chinese saw, and chissels, and a boring instrument peculiar to themselves, formed in the shape of a small gouge chissel, which they drive into the timber with a small wooden mallet, turning it round at the same time by a cross pin inserted in the handle of the tool. This is a very efficient instrument. The Malays neither work in brick nor stone.

beneficial to the Government, and of less difficulty to all parties, could the work be contracted for by a Chinese, who having a full knowledge of the habits of his countrymen and possessing their confidence, would the more easily procure them for this unusual undertaking, and who would also in cases of difficulty or misunderstanding with the workmen themselves, have that influence over them, which a foreigner could not expect to possess. A Chinese house contractor, who had executed satisfactorily several Government buildings under my superintendence, was consequently recommended for the contract for the Horsburgh Light-house on Pedra Branca, in the same manner as he had been for the Light-house on Peak rock. It will be seen by the sequel, that the contractor at an early period of the operations abandoned his contract and left Singapore for his native country, after procuring a large quantity of goods from the merchants, with which he absconded. The advantages proposed by having a contractor bound to the undertaking were thus rendered nugatory, and I now much question, if the operations would have been at all benefited by his presence, even though he had been willing to stand to his engagements; still the reasonings in favor of the arrangement before the commencement of the work appeared to be, to say the least of them, plausible.

For the purpose of carrying out materials, I proposed that decked lighters (called here "tonkangs") should be attached to the works, also two gun-boats for the conveyance of myself, workmen and light materials; the occasional assistance of a steamer for towing was also asked for. The necessity of being armed, will be seen from the extracts regarding Piracy in the immediate neighbourhood. (See Appendix II.) The knowledge of our being prepared, it was thought would be sufficient to prevent molestation, and subsequently, during the whole time that we were on Pedra Branca, no suspicious vessel was seen either from the rock or the lighter or gun-boats. During the same period, smaller boats were attacked, belonging to our Chinese stone-cutters of Pulo Ubin, in which 3 of them were killed. Information was given me of 8 men belonging to the the same district being killed, between Singapore town and Pulo Ubin, which comprises a distance of only fifteen miles. In September, 1851, the gun-boat's sampan when proceeding from Pedra Branca to Singapore, with 5 men in her, was followed by a piratical boat, having 9 men, but they escaped by pulling. It is curious that on this occasion the Gunner in charge, while giving the men muskets, neglected to give them powder and ball. As the Chinese mostly go unarmed, in bands of 3 or 4 only, they thus easily become victims to the piratical sea-tribes, who constantly lurk about the narrow inlets, and who look upon the killing of a Chinaman for the sake of the little rice or money he may have in his possession with no other feelings than they would have in spearing a turtle. The seamen employed in these parts are


Singapore Strait.
Barbukit Hill.
False Barbukit.
China Sea.

PEDRA BRANCA.
April 1850.

T. Picken, lith.

Day & Son, Lithrs to The Queen

J. H. Richardson, 23 Cornhill, London.

composed of Malays and Javanese. If properly treated, they make active sailors, obedient to command. To the sailors were to be assigned the duties of cutting wood and procuring water, also of landing materials and acting as a guard on the rock.

PART III.

Occurences of 1850.

Preparations made for the commencement of the Light-house operations.—Lantern, machinery apparatus and lightning conductor, first ordered from England.—Contract entered into with a Chinese for stone and brickwork.—Plant and tools got ready in Singapore.—Stone procured at Pulo Ubin instead of the Rock itself.—Description of Pulo Ubin.—First landing to inspect the rock.—Mode of laying, joining and marking the courses at Pulo Ubin Quarries.—Proceed out to the rock with the workmen.—Men at Pulo Ubin unwilling to go.—Party of workmen landed on the rock, communication with whom is cut off by the N. E. monsoon setting down.—Further attempt to land more men failed.—Those on the rock rescued by means of a line and buoy, by which they were hauled through the surf.—Lie under the shelter of Point Romania for 8 days.—Workmen beg to be allowed to return to Singapore.—Description of Point Romania and employment there.—Proceed out to the rock again and effect a landing.—Lethargy and heedlessness of the Chinese.—Description of the party settled on the rock.—Encampment of the party.—View from the top of the rock.—Marking out the foundation of Light-house.—H. C. Steamer "Hooghly" leaves the rock, Chinese beg to get away also, and throw down their tools and sit gazing at the vessel till out of sight.—Heavy squall, large vessel escapes shipwreck on the rock.—Intense heat on the rock and inconvenience from dust.—Pier commenced.—Contractor sends out coolies instead of stone-cutters.—Return to Singapore to engage men and bring out contractor.—Dissatisfaction created amongst the men by contractor's presence.—Attempt of the Chinese to escape from the rock.—Gun-boat "Nancy" arrives, is caught by a heavy squall which terrifies the commander and crew, they refuse to do duty, and demand leave to quit the service.—Return to Singapore unwell.—Description of Derrick crane.—Foundation stone laid.—Delays at the Pulo Ubin quarries.—Mosquitos at rock.—Short allowance of water, owing to misconduct of the commander and crew of the "Nancy."—Other gun-boat absent on repairs.—Contractor declares himself unable to meet his engagements, and absconds.—Chinese increase their demands for price of materials, 41 per cent.—Engage workmen myself, but can only obtain the most abandoned class.—New pier required.—Best class of Chinese afterwards found willing to engage for the rock.—Crazy state of the "Nancy."—Chinese mode of carrying burdens.—Habits of Chinese.—Fishes of the locality.—N. E. swell sets in on the 16th October.—On 21st finish first season's work up to 50th course.—Send Chinese off.—Remain with lascars to stow away materials.—Abandon the rock on the night of same day.

I received information from Government, by a letter from the Hon'ble T. Church, Esq., Resident Councillor at Singapore, dated 14th December, 1849, that the construction of the Horsburgh Light-house, according to my plans and specifications, had met the sanction of the Honourable the Court of Directors of the East India Company. The early part of the year was consequently devoted to making the requisite preparations for the coming season, when the strength of the north-east monsoon should have abated, so as to enable us to land on Pedra Branca; this, from the experience of former monsoons, we expected would be in the end of March or the beginning of April.

I accordingly commenced to make the necessary arrangements connected with the works; the first of which was the procuring of such parts as would be required to be executed in Europe. These consisted of the lantern, lamps and machinery, with a lightning conductor. For this purpose, Mr Alan Stevenson, the eminent Engineer to the Northern Light-house board, was addressed by letter, accompanied by charts of the Straits, remarks on climate, and other information, necessary to be made known for his consideration and from which he was requested to decide on the most proper kind of light adapted to the position, make the requisite plans and have them executed under his supervision.

The contractor for the stone and brick part of the building was next communicated with, and an agreement entered into for their completion. The contractor's name was Choa-ah-Lam, a Chinese of the Kheh tribe. In the written contract entered into, he and his security engaged to do their portion of the work for the sum of 10,600 Spanish dollars. In the performance of the work they were bound to observe certain conditions as to workmen and materials, which it is scarcely worth while here to set forth. On the part of Government it was engaged that two gun-boats should always be in attendance at the works and that a steamer when necessary should be furnished for the purpose of towing materials.

Having settled the preliminaries, my first care, during the three months that intervened before we could hope to effect a landing and commence operations, was to prepare the necessary tools and tackle, that I could anticipate would be required at the rock. On the 14th of January these were commenced at the Light-house bangsal (work-shed) and consisted of the following:—A derrick crane, stone lifters, mason's levels, plummets, and batter templets, iron and copper cramps, copper hinges, models for the courses of the building, jumpers, hammers and other boring and blasting tools, ring bolts, set squares, straight edges, workmen's tools for cutting granite, iron bats, buoys, water tanks, &c., and many others minor things, which were equally requisite and the want of which would have stopped the particular department to which they belonged for weeks, before we could have procured them at the rock from Singapore. For this reason too minute attention could not be given to each detail. Mr John Bennett, a practical engineer, was engaged as foreman to assist me in the works, and also to take my place at the rock, when I was necessarily absent from it on the business of the Light-house. By the end of March all the materials mentioned above were prepared and we only waited the coming of the H. C. Steamer Hooghly to tow the lighters out to the rock, and at the same time convey myself and workmen with their tools and such other light articles that she could stow on deck.

It had been my original intention to cut our stone for the building from the rock itself, where several large and useless blocks, sufficient to finish all the ashlar work, lie packed together, as already described in Part 1, and I had mentioned in the terms of the contract, that 40 stone cutters should always be kept on the rock for this purpose, but shortly after the contractor had commenced to make his preparations, he found great dislike amongst his countrymen to proceed in such numbers to the rock, on account, as they said, of the heat of the climate and exposure to it, also to the closely packed manner in which they would require to live and work, the want of water to bathe in (sea-water is never used for this purpose, and repeated daily bathing is absolutely necessary to the native,) they protested would soon sicken them. They declared to me, on the contractor's bringing them before me, that they could not possibly consent to go to a place where they would be in such numbers, as they not inaptly expressed themselves, cooped up like ducks and fowls. I was much disappointed at this circumstance, but on after reflection and on considering that the months intervening might be usefully employed in dressing the courses, at the Singapore granite quarries situated on Pulo Ubin, and distant from Singapore about 15 miles and not far out of the direction towards Pedra Branca, I consented to this alteration of our plans and obtained the concurrence of the authorities. In the early part of February, sheds were erected at a convenient place on Pulo Ubin, close to the shore where our lighters could safely run themselves on to the beach at high water and lie till loaded. During February and March, the granite stones were quarried and dressed, but the operations went on very slowly for reasons to be hereafter mentioned.

Pulo Ubin is a fine wooded island, situated in the Old Straits or Silat Tambrau, and its harbours and shores are perfectly protected from all weathers. The formation is granitic, its composition varying much in different localities. The spot chosen by me for Light-house purposes possesses a granite compact in grain and of a light blue colour, and has the appearance of great durability. The rock is found in large square blocks, isolated and projecting above the surface of the ground. The surface of the stone displays no decomposition excepting in a thin brown rhind, not ⅛ of an inch in thickness, and underneath which the rock is perfectly sound and uninjured by the atmosphere. The rock of Pulo Ubin is more *fissile* than that of Pedra Branca, and is therefore more easily worked into any required shape. Blocks at the former place, measuring 30 feet long, and 20 feet in breadth and height, were split down the middle and broken up to smaller pieces during the progress of the works, while I found at Pedra Branca that blocks of not a quarter the dimensions of this were with the greatest difficulty made to yield to the wedges of the Chinese. We could always calculate on the plane of rupture in the Pulo Ubin stone, this, in the few instances at Pedra Branca that were tried, yielded in a manner entirely different to our expectations.

On the 6th of March, I proceeded to Pedra Branca in the H.

C. Steamer "Hooghly," accompanied by the contractor with 4 masons and 1 carpenter, to inspect the rock prior to commencing operations. We arrived about 8 in the morning and landed with some little difficulty on the southern side. We found 4 of the brick pillars built in November 1847, still standing and in the same condition as reported in March of the following year, which proved that during the intervening period, no heavy sea had gone over such parts of the rock as are most elevated and sheltered. A swell was still coming in from the north-east, and when I pointed out the bight on the north side of the rock, where I intended to land the materials, which was now the exposed side, though it would be the sheltered one in the S. W. monsoon, I could not help remarking the looks of incredulity with which the contractor met my assurances that the sea would soon be calm, and boats easily brought in to it; he seemed to prefer ocular demonstration, to any of my assurances. This struck me at the time as omening ill of his future steadiness to his engagement. The slight swell seemed quite to have frightened both him and his men, for it was with much reluctance they were persuaded to leave the steamer with me in the boat to land on the rock, and when we arrived alongside, with the helplessness of most landsmen at sea they had much difficulty in leaping from the boat on to the projecting rocks. The monsoon had evidently not entirely subsided, for when we reached the steamer, at about 10 A. M. a pretty brisk breeze was blowing from the North East. We returned to Singapore with somewhat doubtful anticipations,—I as to the contractor's future conduct, he as to the probable profits of the venture.

By the end of March everything having been got ready for our settlement on the rock, Mr Bennett was recalled from the Pulo Ubin quarries, where he had been overlooking the cutting of the courses, and where he was succeeded by a Chinese under-foreman, who was taught the mode of cutting the stones to the models, and marking and numbering each for the place it was to occupy in the building. For this purpose moulds had been prepared at Singapore of the section of each course, and the plan of each bed. Each class of stone-cutters had their various head-men, to whom were given the moulds appertaining to the courses which they had undertaken; on each course being finished it was laid on a level floor, constructed with smooth boards, tongued and grooved into each other; on this floor was marked off, by a trainer which had the radius of each course marked upon it, the circumference of the lower bed of the course that was ready to be laid. The stones were laid to this circumference and carefully joined, so as to break joint with the immediate courses, above and below. As each circumference lessened towards the top of the tower shaft, marks at the joinings of each stone in the various courses could readily be retained on the floor, without causing any confusion, so that though a course was removed, the positions of its joinings could be at once ascertained by reference to the marks made on the floor.

A diameter was drawn on the floor and after the course had been properly laid and jointed, a perpendicular mark was made on the course, at either end of the diameter, which corresponded with the centres of the doors and windows of the Light-house; when the course belonged to one of those having a door or a window, then the window or door jambs were laid at equal distances on either side of the diameter. All the stones were marked with the number of the course, and each joint in the course was also numbered, commencing from one of the ends of the diameter; the north-east end was fixed upon as the commencing point and adhered to, till all the courses were finished. At first we had only one floor prepared for fitting the courses, but when I was forced to carry on the works on government account, after the contractor's disappearance, I found it necessary to have 3 floors, so that 3 courses might be laid at the same time, as the stones were prepared faster than could be laid down on one floor. I had some doubts at first, as to the Chinese under-foreman being able to lay down and joint properly 3 courses belonging to different altitudes of the building at the same time, but he carried the work on without confusion, and all the courses were found when laid to break joint in a proper manner. Before a course was taken from off the floor, marks were bored with a gimblet into the planks at each of the joints, and as the number of the course to which those marks belonged could always be found, long after the stones had been removed, by applying the trainer, which, as stated before, had all the numbers and radii of the courses marked on it, he had only to measure off and transfer those marks when laying down an immediate over-lying or underlying course on another floor. All the marks on the granite were made with coal tar, and on the planks, where not bored, with China ink; these pigments were perfectly effective and never became obliterated.

The gun-boat "Charlotte," a vessel of 23 tons, and carrying two 6 pounders, with a crew of 27 men, having been repaired and fitted up for the service, was in readiness by the end of March, and the Steamer "Hooghly" having also arrived in Singapore, we now made preparations for starting on the undertaking. During the whole month, the weather had been calm and showed no indications of a change for the worse. I therefore considered it safe to proceed at once with the requisite workmen, with whom I and Mr Bennett intended to land on the rock and place ourselves under temporary shelter, until we had prepared our houses; by this arrangement no loss of time would take place and all the requirements for our settlement for the season could be attended to during the time the steamer was on the station, which was only to be for a short period. By landing at once it would be unnecessary to detain that vessel for the purpose of sleeping on board, and she would thus be at liberty to ply between the rock and Singapore, for the procuring of provisions, water and materials. With this view I despatched Mr Bennett in charge of 11 convicts and 3 Chinese; the former class being quarrymen, who were to bore bat holes, and the latter being blacksmiths for mending tools &c. I intended to follow in the "Hooghly" with the larger body of men immediately, so as to arrive at Pedra Branca before the gun-boat. The gun-boat sailed on the 28th of March, but we could not collect the various workmen that were to embark on board the "Hooghly," before the evening of the 31st. We therefore did not start from Singapore harbour till 3 A.M. of the 1st of April. We had two lighters in tow, filled with materials for the erection of temporary dwellings and sheds, and we also carried 10 Chinese stone-cutters and carpenters. On the same day we touched at Pulo Ubin and took on board other 15 men, principally stone-cutters. The contractor came with us and I was sorry to observe that his men accompanied him with the greatest reluctance and their shipment was not effected till after two hours wrangling, in which they were nearly coming to blows. Some of his men he could not persuade to come, so we were forced to leave them behind. Without a knowledge of their language, I could but little understand the merits of the case or the true causes of the disturbance and consequently unfavorable anticipations as to the contractor's future proceedings could not but occasionally arise. Such men as he obtained were raw from China and unable to speak the Malayan language. I had considered it an essential point to have a few of the people acquainted with Malay, so that I might orally communicate with them and I had urged on the contractor the necessity of this, even for his own interests, but he disappointed me.* I could have obtained one or two men that could speak the language, independently of him, by taking them on their own terms, but at this stage of the proceedings I thought it inexpedient to interfere between him and his workmen, as I would thus have destroyed his legitimate influence over them, which would have seriously injured his dealings with them by creating a distrust as to his stability and power to pay them. We arrived at Point Romania the same evening and anchored for the night.

---

* Not the least of our troubles was occasioned by the number of languages spoken by the various workmen. I may mention the following facts to illustrate not only the cosmopolitan nature of the population of Singapore, from whence our labourers were drawn, but to afford an instance of the variety of classes the European in this part of the world enlists in his undertakings. Though most of them holding opponent creeds and with customs abhorrent to each other, the hostile feelings excited by these circumstances are held in abeyance when under his direction—labour is the only scale by which they are estimated. During the progress of the works there were three classes of Chinese employed, none of whom could speak each others language, being as different as French is from English and only one-tenth of whom could speak Malay, the lingua Franca of these parts. Besides these there were Malays, Javanese, Indo-Portuguese, Boyans, Klings, Bengalese, Papuas from New Guinea and Rawas from the interior of Sumatra, which, with English, counted 12 languages. The Chinese for the most part had to be directed by signs. Malay and Hindostanee were the channels of communication.

We found the gun-boat there also at anchor under the shelter afforded in the Diana Cove and I waited Mr Bennett's coming on board to report proceedings with considerable anxiety, as I expected he would by this time have been out at the rock. It appeared that he arrived at Pedra Branca on the afternoon of the 29th March, when he found the sea tolerably smooth and was able to land on the north-east side of the rock with some difficulty. He landed 4 convicts and commenced making their huts that night, and next morning he tried to land again but could not accomplish it until noon, at which time it was ebb tide, when he landed on the south-east side of the rock. He then sent the 11 Convicts and 3 Chinese on shore with their boxes, rice and two casks of water and set them to work. On the 31st he proceeded with the landing of more water and provisions, in which service he encountered great difficulty, the swell and breakers having increased during the night; about noon the wind set in strong from the north-east, which so quickly drove a heavy surf on the rock that communication between the party on board and those on the rock could no longer be attempted, and further intercourse was thus cut off. The gun-boat lay at anchor to the N.E. of the rock in 12 fathoms water, which was at that time the only anchoring ground known to us, she thus had the ledge of rocks directly astern at a distance of little more than ¼ of a mile. In this perilous position the gun-boat rode till ½ past 12 when the commander reported to Mr Bennett that the vessel could hold on no longer. The waves were now making a breach fore and aft and had the anchor not held or the cable snapped on the turn of tide to flood, the destruction of the vessel could scarcely have been averted; they therefore weighed and ran for shelter under Point Romania where they arrived at 2 P. M. They proceeded to fill water and cut fire-wood with the intention of returning next day, but the commander of the gun-boat deemed the sea too heavy to risk putting out. The gun-boat therefore remained under shelter of Point Romania, during the 1st of April. We weighed at an early hour next morning and cast anchor off the rock at 8 A.M., the gun-boat following us and arriving about nine. When we arrived off the rock the men that had been left there did not seem to feel their situation at all agreeable, for they perched themselves on the tops of the rocks and waved handkerchiefs at the end of sticks by way of calling our attention. On this day the sea did not seem to be heavier than when I landed in March, so I proceeded to the rock with the intention of landing with the rest of the Chinese. This I could have easily effected by leaping ashore, but the Chinese being less willing and having boxes to land, their disembarkation could not have been accomplished without injury to some of them and the loss or damage of part of their stores. I had intended to have made the Chinese erect their houses while the sailors were employed in landing water and provisions, but when we came alongside of the rock the breakers were too heavy to allow the attempt to be at all safe. We therefore returned to the Steamer, which lay at anchor till 10 A.M.; when finding the lighters astern shipping water and otherwise unmanageable, Captain Stewart deemed it necessary for their safety that we should return for shelter. After communicating with the people on the rock, from whom I ascertained that they had 2 days supply of water and also with Mr Bennett, whom I instructed on the fall of tide to take the people off, and which he assured me, judging from his former experience, there would be no difficulty in doing, I proceeded to Point Romania. With the fall of tide, the sea did not abate as was expected and though Mr Bennett himself landed once or twice he could not persuade the people on the rock to follow him in leaping into the boats. As they were all unaccustomed to the sea, they possessed no agility on that element, so could not take advantage of the moment for leaping, when the boat was hauled close to the rock after the breaker had passed; of the number only 3 eventually got on board the boat, one Chinaman and two Convicts. In the attempts to get the people off one of the boats got much damaged against the rocks and was barely kept from sinking before they reached the gun-boat. As night come on the wind and waves increased so much that the commander reported he could ride at anchor no longer as the water was making a breach over the vessel; the anchor was consequently weighed, but came up with one of its flukes broken off. They arrived at Point Romania at 9 P. M. and communicated with the Steamer next morning.

The affair seemed now to have assumed a more serious aspect than I was at first disposed to look upon it, for the wind had not abated during the night, and it was absolutely necessary to rescue the people on the rock as their drinking water would be well nigh finished. We therefore left the two tongkangs (lighters) in charge of the gun-boat and the "Hooghly" steamed out to Pedra Branca. We anchored at the distance of half a mile to the north of the rock, instead of the north-east, as close to the edge of the bank as possible, so as to enable us to pull back to the steamer with greater ease, for the wind was blowing briskly and the tide being flood was also against our return. I proceeded in the cutter and the jolly boat attended in case of accidents. We went provided with grapnels to anchor the cutter, and a buoy and line to effect communication with the shore. On closing with the rock we found the surf to be very heavy. We therefore anchored outside and one of the crew of the cutter, who was of the Orang Laut tribe (men of the sea) and an expert swimmer, tied a line round his waist and swam for the shore. On two or three occasions he was immersed under the breakers for a considerable time, but effected a landing on a shelving rock with only a few bruizes. I may mention that he was a lad of 19 years of age, and had formerly composed part of the crew of a piratical boat that was taken by the late Captain Congalton in the vicinity of Pinang; being at the time under 12 years of age, his youth saved him from the gallows, to which his elder fellows were sentenced, and Captain Congalton, who formerly commanded the Steamer "Hooghly," to save the boy from reverting to bad habits, took him under his care and brought him up on board his vessel. Anjoot (the cast-away) for such was his new name whatever his former one might have been, now drew on shore a larger line to which the buoy was attached and by which he hauled it on shore, then tying the men by turns to it they were separately hauled on board the cutter through the surf, and after all had been safely rescued he followed. The convicts behaved very well under the trying circumstances. Notwithstanding the bruizes which they received against the rocks, they cheerfully assured me that they would gladly return with me to the rock after the north-east wind had abated, but the Chinese betrayed the greatest cowardice and in a very down-hearted and melancholy disposition returned to the steamer. I attempted to encourage them a little before their return to the vessel, but to no purpose. I was therefore sorry that it was unavoidable they should meet their countrymen, who were necessarily kept on board in inactivity, and whom they might impress with all their fears and terrors at the wild discomforts they had suffered on Batu Putih. The approach to the rock we found even in a slight sea to be attended with great danger to small boats, from the eddies occasioned by the rapid and obstructed tide way. The sea breaks and rolls where these eddies exist and they extend for a quarter of a mile on either side of the rock, but after experience taught us how to avoid them. As already mentioned in Part II, the rock being small affords no shelter from the waves on any side; it has no creeks nor gulleys, where a little shelter may be had, so that the waves from whatever direction they come, wash equally heavily all round and meet unabated in force on the lee. When we anchored off the rock and had extended a line from the cutter's stern to the shore, at each time a man threw himself into the breakers we hauled the boat as close to the shore as possible so as to draw him in quickly; as this necessarily brought the boat's side to the coming waves the danger of being capsized and filled by a breaker chancing to be heavier than the rest was much greater than if we could have had her head to the waves. The hauling of the boat close to the breakers was requisite as the men attached to the buoy were mostly much exhausted before reaching the boat, when they were lifted in and laid on the bottom to recover themselves. I was informed on my return to the Steamer by Captain Stewart that he had watched our operations with much anxiety, for each wave as it came breaking and bounding over the outlying rocks hid us for a time from the steam vessel and seemed to have overwhelmed us, until we were again seen to rise on the crest. One breaker higher than the rest broke over and half filled the boat, but the men by smartly hauling out the boat on their approach avoided any accident. I will scarcely ever forget the looks of terror depicted in the countenances of the Chinese at the moment of their throwing themselves into the surf. The clothes of the poor men taken off, were necessarily left behind, and few of them when taken on board had more than a rag on their loins. We made shift to cover their nakedness but the Chinese were unconsolable and lamented their condition in a most unmanly manner, by giving full vent to their lacrymose propensities.

After we were all safe on board we weighed anchor and steamed for Point Romania, there to lie at anchor until the north-east wind should abate. The contractor who was on board all this time I considered it unnecessary to detain, and as the gun-boat had lost her anchor and besides sprung her foremast, it was necessary she should return not only to effect these repairs but also to procure provisions and opium for the Chinese. He therefore embarked on board the gun-boat and returned to Singapore, and the Chinese and two Convicts who had remained on board the gun-boat were brought on board the steamer. The contractor seemed heartily tired of the job and so did his men, for they flocked towards the cutter which was to carry him to the gun-boat and several leaped into her. All begged to be allowed to return to Singapore, they uttered many protestations that they would come back when we wanted them, and a clearance was only effected by a rope's end heartily applied by the lascars of the Steamer to make them fall back.

For eight days we lay wind bound under the shelter of Point Romania, and the wind increased in force daily for five days when an apparent change began to take place. The waves by dashing up against Peak rock and covering it with their spray, was a sufficient proof of what was going on at the more exposed position of Pedra Branca. While we lay here it was necessary to keep a sharp look out on our Chinese passengers as they now evidently would have escaped if opportunity offered. While we daily landed the convicts to cut firewood and spars, the Chinese were only allowed to land and bathe in numbers of 3 and 4 at a time. This vigilance was requisite, for had they at this time escaped to Singapore so exaggerated an account of the hardships of Batu Putih would have been spread amongst their countrymen, that we would on future occasions have had great difficulty in obtaining workmen. The stone cutters and masons especially, being few in number, had it in their power to make their own terms, and it was therefore of much moment that nothing unfavorable to the service should reach the ears of those in Singapore. On this account I was reluctantly forced to detain one of the three Chinese, who had been attacked with dysentry while on the rock,—his case for several days did not appear dangerous, but owing to his being an opium smoker, he afterwards sank rapidly when we had no opportunity of sending him away, and he died just as the "Hooghly" dropped anchor on her return to Singapore roadstead.

While remaining at anchor off Point Romania, the interval, though clouded by anxieties as to the success of the undertaking, was not without its recreations. The shore of this south eastern point of the Malayan Peninsula, called by the Malays Ujong Tannah (Land's End), possesses beautiful sandy beaches, which are overhung by dense and almost impenetrable forests. These forests contain magnificent trees of various kinds of timber, which with their branches shade the ground, the noon-day rays of the sun seldom penetrating through their thick foliage. The middle of the day was generally spent in these forests in selecting spars and in overlooking the convicts, who were employed in cutting down the proper species of timber for the various purposes of the Light-house, and the lascars were engaged in watering from the little streams that are occasionally to be found making their way to the beach. In the evening when the hours of labour had ceased, pigeon shooting on the Water Islands afforded considerable sport, until our repeated visits scared the birds away. There are various kinds of pigeons to be found in the forests of the Peninsula, and they seek refuge at night in great numbers on the islands of the coast. They reach their roosting places about 5 in the evening and leave again at 6 in the morning; thus in the cool of the evening, the sportsman without much fatigue, indeed no fatigue at all, may sit and fire as they approach, but others fond of exercise may have enough of it in climbing up and down the steep rocky sides of the islands, in pursuing the birds on their changing their positions. I have found three species of pigeons on these islands,—the Pergam, a large blue one, not unlike the cushet or wild pigeon of our mother country, its flesh is coarse and tough; the Rawang, a beautiful white pigeon with black tipped wings, and the Poonie, a small green pigeon, which, with the Rawang, has tender and well tasted flesh. The drawback to the pleasure of frequenting these jungles is in the presence of tigers and bears, snakes and scorpions, but the danger of meeting them is generally exaggerated and was seldom thought of by us. The underwood being dense renders the tiger more dangerous than in the more open jungles of India, he never springs but when he is certain of his mark, and is never or very seldom seen until that takes place. Hunting him on the backs of elephants is rendered impossible by the thickly entangled and rank vegetation; the searching for him on foot in the nearly impenetrable maze, though attempted by a few, I have never known to have ended by *bagging* one. Land leeches are numerous and troublesome in these jungles, they cling to the person and inflict small wounds, which though without pain at first, become irritable and sometimes difficult to heal.

On the 10th of April, the sea seemed to have considerably subsided. I therefore proceeded out in the gun-boat, which had returned from Singapore, to examine the landing and found it practicable. We returned that evening and having got the lighters alongside the Steamer we prepared to start next morning.

On the 11th of April, the Steamer, lighters and gun-boat arrived off the rock early in the morning; we immediately commenced landing the materials for our temporary dwellings, the erection of the huts being at the same time carried on. By the evening ten days' water was stored on the rock in barrels and one month's provisions.

On the morning of the 12th, all the workmen were landed and I made preparations for remaining with them; we had brought a number of kajangs with us, to afford a temporary shelter from the weather for the few days that would be required in making the dwellings, which were to last out the season. These kajangs are made of the long leaves of a small palmite sewed together with split rattans, they are in size about 6 feet by 8 feet and as they are stiffened with nibong lathes (another palm), by bending them in the middle to a right angle, when laid with their ends on the ground, they appear not unlike the gipsy's cover to be seen on the road sides of England. Such a wigwam affords inside a space of 6 feet by 5 and 3 feet in height, and in such a domicile Mr Bennett and I lived together for some days, till we got more comfortable quarters erected of plank and attap (leaf of a palmite used in thatching). The establishment landed on the rock consisted of the following besides myself and Mr Bennett,—2 Chinese stone breakers, 11 Chinese stone cutters, 5 Chinese carpenters, 3 Chinese coolies, 3 Chinese blacksmiths, 1 Chinese cook, 11 quarrymen, (Hindoo and Mussulman Convicts from India), 6 lascars, (sailors from the gun-boat Charlotte), 1 Hindoo cook and 1 Mussulman table servant, total 46 persons. Before proceeding I will pause to give a description of the rock and the motley assemblage on it.

The Chinese after their long and tiresome stay on board the Steamer, many of whom were subject during that time to sea-sickness, on arriving at the rock seemed not displeased to exchange it for the unstable deck; they at best looked upon the Steamer as a prison and in exchanging one for the other, the rock possessed the advantage of being firm, there was no pitching or rolling about to prevent them from having a comfortable draw at the opium pipe. Our contractor seemed to have picked up the dregs of the population, most of the stone cutters seemed especially so with their emaciated and debilitated looks, which their long stay on board had not improved. They were all inveterate opium smokers, and as they landed from the boats they took their kajangs and sheltered themselves from the wind in the various nooks and corners, lit their little lamps, and lay down to smoke. Such indifference and apathy at a time that our greatest exertions were called for, was, to say the least of it, most disgusting, but as overburdening lethargy which had overcome them, owing to the want of the much abused indulgence, restrained and withheld all their energies; they were utterly reckless as to their duties. I went to each alternately to endeavour to rouse them, but to no purpose; until they had obtained a sufficient quantity of the exciting drug, it was of no avail to meddle with them. Heedless and haggard, they now appeared to be the most unfit and unlikely people in the world to undertake and complete the work, for which they had been engaged; the attempt to carry it out with such a class at best seemed a desperate one. By the afternoon their torpor had left them considerably and they commenced erecting their shed to cover them at night, but so regardless were they otherwise, that their rice and provisions would have been left to rot in the damp, had I not got the Malays to secure it. One act they did not neglect, in order as they said to propitiate the spirit of the rock; this was burning pieces of gilt paper in various parts, and also securing a portion of them on the highest point of it. They also burnt joss sticks and before sticking them into crevices of the rock bowed reverently three times.

Notwithstanding the hard exposure and many annoyances, I could not help contemplating with considerable curiosity the personal appearance of those who were to be such close companions for two years to come, and whose behaviour would so intimately affect for better or for worse the undertaking to which I was bound. The figures of the Chinese were unique in the extreme, with their loose hanging dress, that only reached to the knee, their wicker umbrella hats covering their yellow tawny countenances and their shaven heads, from the back of which depended their long plaited tails. The convicts, natives of Hindoostan, presented an equally picturesque and more parti-coloured group. They had now put on their dresses that had been left in their chests when they were rescued from the rock, and of which they had now obtained repossession. Large red and white turbans covered their heads, mantles and wrappers of various gaudy colours completed their body dresses, and their dark bronze complexions, with features of the Caucasian type, contrasted strongly with the round flat Mongolian physiognomy of the Chinese. These convicts were mostly Hindoos, of whom one was a Brahman, and one or two were Mussulmen. All had been transported from India, for heavy crimes of various degrees,—two or three had the word "murder" tatooed on their brows. The Hindoos, as their custom is, seemed most careful not to let any person see them cook or eat, and each retired to the most sheltered and concealed spot that he could find, to take his solitary repast before the labours of the day commenced. The Brahman was most concerned about his drinking water, and would allow no one to partake out of the same cask as himself. On leaving Point Romania he filled the cask himself, and prayed of me to allow no one to touch the water in it, as he said he could not taste of it afterwards without losing caste, an object as much valued by him as life. It appeared that when left on the rock, as he had filled his cask for himself alone, and there were only 2 casks besides for the other 13 men who had landed with him, his was well plenished while theirs were empty, but as necessity has no law, he was forced by the rest to give up the monopoly, the Chinese sharing alike with the others, but the Brahman dealing the water out to them with his own hands. The Malay lascars, although in physiognomy not unlike the Chinese, are altogether of a different character. They are of more slender make, their religion is the Mahomedan, but bigotry or the trammels of caste have no hold on their minds. While they refrain from intoxicating liquors and the flesh of swine, they make little difficulty about their food in other respects; they take well to Europeans, to whom by their honesty and pluck when occasion requires it, they are most useful though humble allies. While they abhor all mechanical or confined labour, they are useful and active assistants in desultory employments and will work hard and spiritedly, if not continued too long. The Malay has a copper coloured complexion, he is quiet in his manners, of sensitive temperiment, light hearted, careless of money, respectful to superiors without any cringing; the kris, which is always worn out of British settlements, establishes a politeness of demeanour, which being departed from is too apt to occasion its ready use; his most prominent vice is the little value or regard which he sets on life, yet he is trusty when well and temperately used, and to our Malays therefore we looked as the support of our authority in the little settlement, to them was entrusted the care of the water, the most important article, and arms, and they slept next to us on the rock until our house was built, after which a room was prepared for them in it.

We erected our temporary wigwam on a small ledge to the east of the main rock. This ledge is 25 feet long and 15 feet broad and is about 7 feet above the level of the sea at high water. Upon the same ledge a place was prepared next us for the Malays, and beyond them for the Convicts. The Chinese I set apart from us on the western side of the rock. The filthiness of this class was disagreeable and the fumes of opium created an unpleasant smell in their vicinity; their constant quarrels and rude gestures often called for interference. On our landing on the rock we found that the sea had washed over the parts that we now temporarily occupied, as was proved by the state in which the effects of the Chinese and Convicts had been found. I therefore made the Chinese build their house for the season between the middle and western high rocks, while we commenced to build our house between the middle and eastern; this was attended with the inconvenience of having the Chinese close to us, our houses being thus not more distant than 10 feet, yet until we knew how the sea broke on the rock during the south-west monsoon, I considered it unsafe to occupy the lower ledges of rocks, where we would have had more room and been more apart. The experience of the season showed that we could safely have placed our houses below until the coming in of the N. E. monsoon. I afterwards did lodge many of the Chinese on the eastern rock, as we found their upper house too crowded; in this hot climate people cannot be packed in the manner that is done in colder latitudes. At sundown of the first day of our landing we had made ourselves as snug as our scanty means would admit of, and after a busy day I went to the top of the rock to look around me before darkness came on.

The coast of the Malay Peninsula lay in a westerly direction, 9 miles distant at its nearest point, and from its outline rose the sharp pointed Barbukit hill,—more distant were Johore hill and False Barbukit; to the south lay the Bintang shore, a little more distant than that of the Malay peninsula and out of whose forest-clad surface rose the double peaked Bintang hill, well known to mariners. The sandy beach on either coast could just be seen. As darkness came on we crept into our wigwam. The position seemed strange and unusual to all of us, and untoward reflections could not be prevented from intruding. Our Malay lascars sung in rather plaintive notes some simple pantuns about "Batu Putih de tingah laut," yet notwithstanding the noise of the waves washing up close to our heads,as we lay down overcome by the fatigues and great heat of the day, we soon fell into a sound sleep which prepared us for the labours of the ensuing one.

On the 12th and 13th we were engaged in landing the materials for our dwelling houses and in erecting the house for the Chinese. This was done in a rough manner by inserting posts into the fissures of the rocks and binding the cross pieces and rafters to them. I considered it an object to get them under proper cover, so that no delay might take place in their commencing the cutting and stepping of the foundation. For this latter purpose I again thoroughly examined the rock and finally settled that the Light-house should stand upon the one on which I had fixed at my former visits. During these two days, therefore, I carefully drew level contours at one foot perpendicular elevations, one above the other, all round the rock. This was quickly effected by the Theodolite and Staff, and the contours marked with coal tar. The next object was to find where the centre of the building would come; this was ascertained by placing a measuring rod level across the narrowest parts of the rock, and dropping plummets at either end, so as to find the greatest available breadth for a foundation. The centre was then found by measuring inwards from either side with a distance or radius belonging to the particular contour, or bed of course, to which the plummet fell.

On the centre being found a hole was bored into the rock on that spot, into which a hard wooden peg was driven, the height of which was greater than the highest part of the rock, and which peg served to support a large mason's level whose beam was longer than the largest radius of the building that we required to mark off. The radii of the several courses were now marked on the rock from this centre by means of a tape line and plummet, and the height of their beds accurately obtained by the large level and graduated staff. The places where the incomplete courses would end by being joined to steps cut into the rock, were marked, and the rock was now ready to be commenced upon by the workmen. Before the stone cutters were employed, the convicts were first set to work to bore holes of an inch diameter along the various parts marked out for cutting; these holes were bored to the depth of the beds of the courses, at 9 inches apart, in order to assist and hasten the operation of cutting out the rock, but I found that they afforded little assistance and might have been dispensed with, as the stone cutters would have got on as fast without this operation. All marks were made on the rock first with coal tar and then by a slight groove cut with a chissel along them; in laying off the marks for the foundation great care was required to be exercised, as there was not above 2 inches to spare between the breadth of the rock and the diameter of the tower.

On the third day after landing, the "Hooghly" left for Singapore, at 2h. 30m. P.M. We were thus for the first time left to ourselves; and as the two days experience of the inconveniences of the rock had not reconciled the Chinese to its narrow precincts, on the last boat proceeding to the Steamer many of them carried down their boxes and little properties to place them in it, and begged hard to be allowed to return. We found that none of the stone cutters could talk a single word of Malay, and the contractor, regardless of my directions and of his own interests, had sent them without an interpreter to make known their wants; it is true that three of the Chinese carpenters could speak the language, but they were of a different tribe and though communication could be had through them with some difficulty, still there being little intercourse or sympathy between these two parties, the stone cutters seemed little to trust what was said to them through this channel. They now looked upon the rock as a prison and from what was gathered the contractor obtained no blessings from them for having entrapped them into such a place. In justice to these Chinese and by way of apology for their past and future ill conduct, I must here state that had one of their number been able to speak the Malayan language, through which he could have freely made known his wants and I could as clearly have stated to him not only my orders and directions, but pointed out the work that was required to be finished, the measures intended for their comfort and the period they would require to remain, I am certain I would have had much less difficulty with them ; but in ignorance of all, they naturally looked upon the hardships, not the least of which was the want of sufficient water, as likely to be continuous and not merely temporary—to be remedied when we had got fairly established in our quarters and had every thing put into due routine. Besides all this, these Chinese were the worst of their class whom the contractor had picked out from the junks at the lowest rates. In describing them they must consequently be held as an exception, for prior and subsequent experience with Chinese labourers has taught me to appreciate their great value. They are hard and willing workers, and might be made capable of executing the most difficult and arduous undertakings in the hottest climates. In the present case the evident apathy of the contractor and his premeditated disappearance, coupled with the fact of their receiving their wages from him, withheld the due influence over the workmen that should always be possessed by the superintendent, it is therefore not to be wondered at that ignorant men of whatever character would prove dissatisfied and unruly, placed in this position. As the steamer weighed anchor and departed, they all threw down their tools and sat gazing at her—they had no heart for the work, nor for want of direct oral communication could I inspire them with a will to do their duty.* The afternoon of the third day was thus spent in idleness by the Chinese, who having abandoned their tools, crept into their beds, closed the curtains and lay down to smoke opium. It is true that this was nominally at the loss of the contractor, occasioned by men paid by him, but it was highly vexatious to the party responsible to Government for the completion of the works. The convicts were employed in boring holes and the Malays in erecting our house.

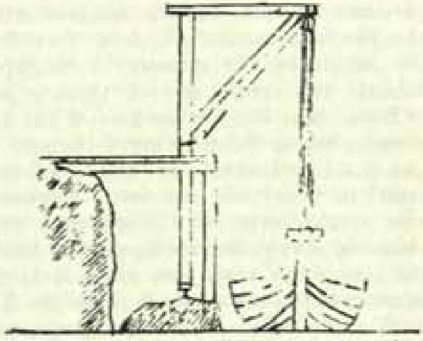
However ominous affairs appeared, when the quiet of the evening had given us time for reflection on creeping into our little wigwam; next morning when I awoke I had a proof that the work was worthy of our most earnest exertions. At three in the morning a heavy Sumatra squall came on, and at half-past five it was still blowing hard, when on creeping out I could just descry through the haze a large ship under trysail and forestay-sail on the north side of the rock, not more distant than a ¼ of a mile. She was then bearing down direct towards us but the dawning light had arrived in time to make her aware of her danger when she instantly bore up and escaped. On going up to the Chinese, I found the storm had entered their house and drenched them through; this was owing to their not having laid small spars over their roof, so as to keep the attaps or thatch from being blown upwards, thus allowing the rain to pour in. This morning, the 14th of April, the Chinese having overcome their lethargy, now seemed to put more heart in the affair and take better thoughts of it, for after breakfast they commenced to split the stones that required to be removed and to step the rock for the foundations. Our hours of work were from ½ past 6 to 11, and from 1 to ½ past 5. By the 17th our house was covered in and partly planked round, so that we left our kajang wigwam and took up our quarters in it. It was 18 feet long and 11 feet broad, and contained two sleeping rooms, each 8 by 4½, and one dining-room, 12 by 9, 1 closet 4 by 3 and a passage, also 4 by 3; below, a small apartment was made for the Malay lascars, close to the fresh water, which was their principal charge. This was stowed in barrels placed on racks. The house was supported on 10 posts fixed to wrought iron bats driven into holes in the rock.

---

* After having done all that it was possible for me to do, short of taking coercive measures, I reluctantly allowed them to pass the afternoon in idleness; being persuaded that ultimately it would be best for the interests of the undertaking that these should be in the meantime avoided. Punishing the men, by striking or flogging, however useful and necessary in certain services, where long engagements are entered into, would not suit here, where free men were engaged for terms not exceeding one or two months. I had resolved to adhere throughout to this line of conduct towards the workmen, departure from which would only be made on affairs coming to extremities; fortunately this never happened, otherwise the operations would have earned an evil repute amongst the Chinese, on whom alone, as stated before, we had to depend for the successful completion of our labours; and the practical effects would have been, that instead of being able to procure good men amenable to reason on moderate wages, which we were afterwards always able to procure, we would have had to pay high wages to such bad characters as could get no other employment. Much extra duty would also have been thrown on our small party of Malays to whom alone we could trust, andwho in case of an open rupture with the Chinese would have been forced to keep watch at night, besides as usual performing much harrassing labour during the day.

On the 17th of April the steamer arrived off the rock at 7h. 30m. A.M. with two tongkangs in tow, but after lying too for a short time, she was forced to put back for shelter to Point Romania, a heavy squall having come on in the morning and continuing to blow fresh all day. Now that the stone cutters had got set to work, we found it necessary to protect them from the wind on so exposed a place as the Light-house rock, where they were so closely packed together while working. The men experienced much inconvenience from the dust and small pieces of granite blown into their eyes, and we therefore commenced surrounding the foundations by a temporary screen made of attaps, about 5 feet high. This effectually remedied the evil and immediately after the steamer arrived next day with her cargo-boats, containing more building materials, and they had been landed, we commenced to roof over the place to shade the workmen from the sun. This covering over the workmen had been early required, for during the calm weather that now prevailed, excepting the periods of occasional squalls, the heat was intense; indeed during the first 6 or 7 days when every person was necessarily exposed to the full influence of the sun's rays from above, and the almost equally intense reflection of them from the white surface of the rock, which had a chalky appearance, owing to its covering of dung of sea fowls, the heat was almost beyond endurance, the skin peeled off from the face and other exposed parts of the body, the lips cracked, and the heat induced a constant flow of perspiration, creating a thirst that large draughts of water could only allay. We could not afford to be liberal in this element as we had only a precarious supply from the gun-boat "Charlotte," whose duty it was to furnish us, and she was absent for repairs in Singapore and the other one that I had applied for to Government had not yet arrived. The covering in of the workmen afforded great relief from this hardship, and on its accomplishment we proceeded to erect a workshop and smithy.

A pier was the next object that demanded attention and we now set to work upon one to be constructed of wood, in the small bight on the north exposure of the rock. This bight was encumbered with rocks and was little more than 3 feet deep at low water, but I anticipated that there would be more shelter here than at any other part of the rock. The pier was made of strong piles braced together and fastened to the rock by wrought iron bats; on the pier we fixed a mast, turning on a pivot, let into a socket cut in the rock. The mast was further held by a collar in the flooring of the pier at half its height; from the top of this mast extended a horizontal boom, upheld by struts from which depended tackle at its extremity. The boom was swung over the lighter, when the materials were to be raised, and when hoisted the mast traversed on its pivot and brought them over the platform of the pier, where they were deposited. In front of the pier there was sufficient space to allow a lighter of 25 tons burden to lie between it and two outlying rocks. The pier erected did not answer our expectation, for when the sea was at all heavy the great influx and reflux of the waves drove about the lighter so much, that none of our warps could hold her, they always snapped and left her to drive against the pier and rocks, until we could haul her out. The pier was only intended to last through the fair monsoon, during the months that operations were being carried on.



On the 19th of April the "Hooghly" returned to Singapore, and a requisition was sent by her to the contractor for more stonecutters, as we were not progressing sufficiently rapidly. It was at the same time requested that he would send a Chinese foreman conversant with the Malayan language for the purpose of interpreting orders to the men. We were forced hitherto to have recourse to signs in order to direct his men, so that misunderstandings were constantly taking place.

By the same opportunity we sent back one of the blacksmiths who had been engaged to sharpen the convicts boring tools, as he had never recovered from his fright when left on the rock at the commencement of operations. During the whole time of the "Hooghly's" lying off Point Romania, wind-bound, notwithstanding I used every mode to cheer him, for I could communicate with him as he spoke the Malayan language, he sat sullen and quiet, seldom speaking to any one, but moping over his distresses On landing with us again on the rock no entreaties would stimulate him to exertion, he either sat all day looking on vacancy or he lay stretched in his bed smoking opium. He at last became really unwell and could taste no food for several days, so I was constrained to send him back, though I feared the harm he might do to our operations, by detailing in a much exaggerated form the hardships that he and his companions had suffered. I consequently sent him on board, and as usual many others rushed to the boats to accompany him, till driven back by our Malays, and little work was done until the Steamer was out of sight again. The Steamer returned on the evening of the 28th, bringing instead of 10 stone cutters that number of ignorant coolies. It now became evident that the contractor was merely putting off time; I therefore determined, now that things had been put in course, to return by the steamer to Singapore, to engage men myself should the contractor fail again in procuring them. To test one of the men that he had sent, I put a chissel and hammer into his hands, but he fell a-crying, telling me through the interpreter, that he was only a cooly. He and his companions were therefore reshipped on board the steamer. The convicts having finished boring the guide holes for the stepping of the rock, were employed in blasting away the rocks on the south aspect of Pedra Branca to low water mark, so as to form a landing place at high water during the calmer periods of the N. E. monsoon.

I embarked on board the steamer at 11 A. M. of the 21st leaving Mr Bennett in charge of the work during my absence, and returned again at 5 P. M. on the 24th on board the same vessel, having procured with great difficulty 10 stone cutters through the medium of the contractor. As his men at the rock had hitherto worked so lazily, I thought it an object that he should himself come to the rock and urge them to greater perseverance and if possible engage them to contract for the finishing of the stepping of the foundations; he consequently accompanied me and slept for one night in my house on the rock which was now nearly completed.

The next morning it appeared that the contractor could effect no engagement with his men, but his presence instead of doing good had created great dissatisfaction among them. The convicts being nearly finished with their work, I shipped 7 of them on board the steamer early in the morning. There now remained on the rock 3 stone breakers, 17 stone cutters, 7 carpenters, 5 coolies, 1 blacksmith and 1 cook, total Chinese 34, 4 convicts and 6

Malays, 1 cook and 1 servant, myself and Mr Bennett,—altogether 48 persons. Before the contractor departed he came with his men in a body, with a long list of grievances in which he seemed to side with them, whether constrained to do so from fear of them or not I do not know; the principal thing they complained of was the small supply of water. I had allowed 2 gallons to each man, which is double of a ship's allowance, but they demanded 4 gallons, besides water to bathe in daily, which would have required 8 gallons for each man a day. This demand being prepo-terous in our position, I of course decidedly rejected; I was willing to indulge them as much as our circumstances would admit of, as I was well aware that the natives of these parts are accustomed to copious ablutions in fresh water daily, and that they avoid salt water as too heating and irrefreshing. Seeing I would not comply with their demands they retired in a very bad humour. I may mention here that on further experience I saw a greater allowance was absolutely necessary and increased it to 3 gallons, and during the progress of the building they had baths pretty regularly with the water that was to be mixed with the mortar and cement.

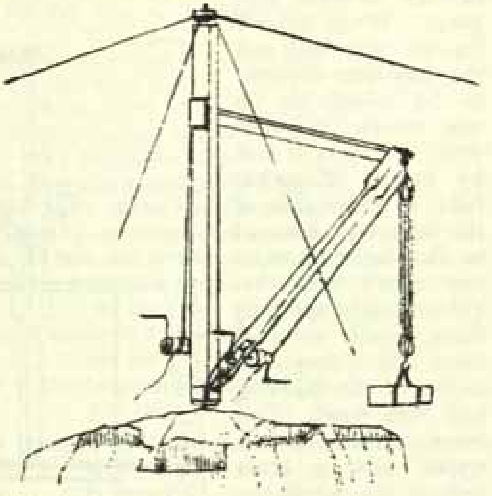
The contractor now prepared to embark and I went up to the house to write my letters to go by the Steamer; it appears that as he got into the boat the Chinese as usual rushed to it, and two leaped into it with so great a determination to get away that blows would not drive them off, but they crept under the seats and held fast to them; a struggle now commenced with the boats crew, composed of 5 Malays, in order to dislodge them. The boat was lying close under the rock at a place where a ledge hangs at a height of 7 feet perpendicularly over the sea; upon this rock the Chinese had assembled, standing upon a heap of bricks with which they had armed themselves, and were about to fling at the boat's crew below. These being irritated at the two contumaceous fellows in the boat, who struck at them several times with their feet, prepared to take harsher measures than merely pitching them over-board. The noise now attracted my attention and on seeing the disturbance I ran to the spot and managed to get between the Chinese and the boat, and arrested several hands that were just going to throw the bricks at the heads of the Malays, who would in their position have been easily mastered if not murdered. The boats crew were still engaged in ineffectual endeavours to get the fellows out, and this they would not have succeeded in without stunning them by blows. Having arrested the Chinese for a moment, I at the same time with great difficulty called off the Malays, whose blood was up and who were nearly unmanageable, and ordered them to pull outside. The contractor all this time was seated in the boat but did not venture to interfere, whether from fear of or concurrence with his men, I cannot judge, but I have no doubt that the disturbance was brought on by his sympathizing with them. The fellows might have been forced out of the boat by calling in the aid of our six armed Malays, who were too ready to be at them, and disappointed in not being allowed, but this would have risked the cutting down or shooting of one or two of the Chinese, which no doubt would have quelled the disturbance and prevented further resistance, yet would this have been a proper course towards an ignorant and helpless crowd completely in our power, with whom we could not orally communicate? The paramount object was to prevent accident or fatal injury to any of the men, for if such had occurred it would have deterred Chinese workmen in Singapore from engaging themselves for the service, and caused a total suspension of operations for a time, if not altogether. I preferred under the circumstances to take the temperate course, so I sent the boat to the Steamer where there was a trustworthy interpreter who could communicate without prevarication what I had to say and I followed in another boat. When I arrived on board the two rioters were called aft and it was explained to them, through the Chinese engine-driver, that as they had engaged themselves to remain at Pedra Branca until the foundation beds were finished they could on no account be allowed to leave, and that if they did not now readily return to the rock it would be necessary as an example to their countrymen to bind them up and flog them and compel them to return by force. This brought them to reason and after some words with the contractor they quietly returned and no such attempts to get away were ever made again. After they were landed the Steamer returned to Singapore, but as usual, as long as she was in sight none of the Chinese would set to work. The operations of the forenoon were stopped by this incident, but they commenced more heartily to their task in the afternoon. The gun-boat which had brought water weighed anchor at the same time as the Steamer and proceeded to Point Romania for more. Thus we were again left to ourselves on the rock.

Up to the 1st of May the works progressed favorably, the stonecutters working at the foundations and the carpenters at the jetty gangway &c.. The 4 Convicts were employed burning down the rock with firewood; this was done by creating a fire on the surface of the rock till well heated, which expands the material and causes it to split off. The fire is then put out, and cold water thrown over it to allow of the removal of the flakes detached; but we found, after pursuing this method for a few days, that it was apt to injure the foundations by detaching much more than was expected; the process was therefore abandoned, and the superfluous rock was removed by blasting with gunpowder. This morning at 5, the Malacca gun-boat called the "Nancy," a vessel of the same size as the "Charlotte," arrived to take her station as a tender to our operations. During the night a heavy squall blew from the south-west and in the morning it was impossible to effect a communication, till about 10 A. M. The commander and crew of the "Nancy," who were composed of Indo-Portuguese and Malays, were much terrified by this squall, so he with a deputation of his crew called upon me to state their wish to leave the service and return to Singapore.

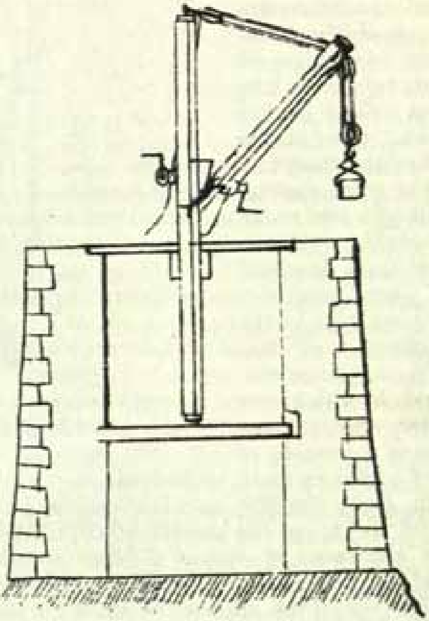
The commander commenced with a loud lamentation on the dangers he had incurred and the hard career of duties that were about to be exacted from him, to be executed at the risk of his life, which he not untruly said if once lost would never be regained! Notwithstanding he was called to shame for using such arguments he persisted in his refusal to do any further duty. I was much surprized and annoyed at this conduct, seeing he and his crew had been informed before they came out as to the nature of their duties, so that they might have obtained their discharge had they had objections to them. Their strike was the more annoying as we now depended on them for our water and firewood. I reasoned with the commander on the absurdity of his and their fears, but to no effect, so I ordered him to anchor off the rock and not communicate with it till I called him. I feared that contact with his crew might disaffect the 6 Malays that we had with us out of the "Charlotte", and I objected to send him to Singapore in command of the vessel, after behaving in such a manner. I therefore kept him at anchor off the rock till the return of the "Hooghly" when I requested Capt. Stewart to take the gun-boat in tow, and place his gunner and some of his crew in charge of her, until the orders of the Resident Councillor were obtained as to the disposal of the mutineers. On their arrival at Singapore the commander and crew were forthwith discharged from the service of Government and a new crew placed in her. The tindal of the "Charlotte" I placed in charge of her as serang, and he very satisfactorily sailed the "Nancy" until a new commander had been obtained for her.

The morning after the "Nancy's" crew struck work, another squall came on at 3 A. M., and on looking for her at day-break she was no where to be seen; she was at length descried at 2 P. M. far out to sea, making her way towards the rock. The commander on seeing the squall coming had got up anchor and instead of lying off and on under little canvas, had run direct out to sea under full sail, no doubt to show how far it had blown him away. A considerable swell set down from the north-east on the 3rd of May. On the 6th, a Dutch gun-boat, sent from Rhio by the Resident, Mr Baumgardt, anchored off the rock; she brought a letter from that gentleman, with the generous offer of keeping two gun-boats on the station, as long as the Light-house operations were in progress. I thanked him in reply and informed him that the presence of one would be very acceptable.

On the 14th of May, I became seriously unwell; for several days previously I had been taken with a severe diarrhoea, fits of extreme giddiness came on at times, accompanied by sudden shocks that twice threw me on the ground. I consequently proceeded to Singapore for medical advice in the Dutch gun-boat, and was accompanied by 7 Chinese carpenters, 1 blacksmith and 4 coolies, who had finished the work required of them. I returned to the rock on the 21st of May, though not quite recovered, bringing with me 2 coolies and 1 carpenter. On the day of my arrival seventeen stone-cutters were sent away from the rock on board the "Charlotte" which was proceeding to Singapore, as they were no longer required, most of the stepping of the rock being now finished. There now remained on the rock 5 stone-cutters, 2 carpenters, 1 blacksmith, 2 bricklayers, 1 cook, 5 coolies, 4 Convicts, and 6 Malays. During my absence Mr Bennett had got the derrick crane, that had been prepared in Singapore, set in its place, to be ready for the hoisting of the courses. The derrick may merit a short description. It was composed of an upright beam of hard wood, 25 feet long by 12 and 9 inches in scantling. At the bottom and top were two wrought iron pivots, the bottom one to turn in a hole bored in the rock and the top one to turn in an iron bush, to which were attached 4 rings. To these rings guys were fastened, which extended towards the cardinal points and were made fast to the rocks at their lower ends, by means of dead eyes, thus the upright beam was held perpendicular, and turned to all Azimuths on its lower pivot. To the lower end of the upright was fixed a jib or derrick, 15 feet long and 8 by 6 inches in scantling, being dressed off to 8 sides in its middle and tapering down to 6 inches near its ends, where it was square. At its lower end, two eye bolts, were fixed on either side, to fit close to other two eye bolts fixed in the upright beam. The eyes of these were held together on the same axis by means of a pin driven through them; on this pin the jib had motion upwards and downwards. At the jib's upper end were sheaves on either side, there were also eye boltsone on the upper and one on the lower side. Within two and a half feet of the foot of the upright beam, was attached a hand winch and at the same height from the ground another was attached to the under side of the jib. From the winch on the upright beam a rope was extended to a sheave half way up the beam, and from thence to the head of the jib by a double tackle, this tackle and winch raised or lowered the jib. A tackle fall hung from the end of the jib, to which was attached the stone to be raised. The raising was effected by one end of the tackle being wound round the drum of the winch, fixed at the lower end of the jib. The jib and tackle load could thus traverse all round the walls of the building and deposit their load at any spot outwards or inwards. The derrick crane was found to be a very effective machine and quite answered all our purposes. The accompanying diagram will make the description more easily understood. During the first season's operations it raised all the materials up to the 56th course and was left standing for next season's operations. By its means scaffolding outside the building was dispensed with, so that all the building operations were carried on upon scaffolding inside. It required six men to work the crane, four at the winch, one at the end of the rope, and one to guide the end of the jib and watch the tackle falls with their load. It would be considered a rude machine by the Engineers of Europe, but I am disposed to think that under the circumstances it was on as good a plan as could be devised.



In India the Engineer is constrained to work with rude instruments owing to the absence of skilful artizans to construct better. The cheapness of manual labour, at the same time, renders the want of proper mechanical appliances of less consequence, as little saving would be effected by their introduction, the original cost and interest thereon in most cases occasioning greater outlay than is consumed by the employment of the former. The unskilfulness of natives in handling machinery is also another bar to its successful introduction. When the building had been carried up 8 feet, it became necessary to raise the jib; for this purpose it was detached from the upright, which was now to be held by 4 beams fixed in the wall, two of which were first laid parallel, close to the upright on either side of it, and upon which the other two were laid in the same manner transversely, thus forming a collar round the upright. These cross beams were notched two over the other two, and nailed firmly with spikes. On the upright were nailed segments of wood to form a gudgeon, which traversed in the square collar formed by the cross beams. The eye bolts were then detached from the lower end of the upright and again refixed at a point above the cross beams, which now served to support a platform. The guys were next removed being no longer required, and then the jib was attached to its higher position on the upright. A double block was fastened to the wrought iron pivot, on the top of the upright through which the tackle that supported the jib was to run. The tackle falls being again fixed to the jib as before, the derrickcrane was ready for use, and could deposit loads at any part of the building as before, in the manner shown in the annexed diagram. When other 8 courses were built and the machine required to be raised the jib was merely detached from the upright and by means of tackle falls at either side of the upright, fastened to the under pivot, it was raised to the required height and held there, until a cross beam laid through the centre of the building had been fixed. This beam held on its upper side a brass socket, into which the lower pivot of the upright was placed, and on which it turned.



The 24th day of May being the birth day of Her Most Gracious Majesty, Queen Victoria, was fixed upon as the day on which the foundation stone was to be laid. Her Majesty's Steam frigate "Fury" arrived off the rock at 11½ A.M. on that day, having tow the H.C. Steamer "Hooghly" and the merchant vessel "Ayrshire," carrying the Hon'ble Colonel W. J. Butterworth C. B., the Governor of the Straits Settlements, who had invited his Excellency Admiral Austin the Naval Commander-in-Chief of the East India Station, and the Hon'ble T. Church, Esquire, Resident Councillor at Singapore, to accompany him; also M. F. Davidson, Esq. Master of the Lodge Zetland in the East, No. 748, who with the office-bearers of the Lodge and other members of that Lodge, had been requested to perform the ceremony of laying the foundation stone with Masonic honors. Various other civil and military members of the Singapore community, together with the foreign Consuls had come by invitation to witness the ceremony. The foundation stone was laid at 1 P. M. and the following articles were deposited under it in an aperture cut into the solid rock; first, a copper plate with this inscription upon it:

In the Year of our Lord 1850,
and
In the 13th Year of the Reign of
VICTORIA,
QUEEN of Great Britain and Ireland,
The Most Noble
JAMES ANDREW MARQUIS of DALHOUSIE, K. T.
being Governor-General of British India,
The Foundation Stone
of the Light-house to be erected on Pedra Branca,
and dedicated to the Memory of the Celebrated
Hydrographer JAMES HORSBURGH, F. R. S.
was laid on the 24th day of May, the anniversary
of the Birth-day of Her Most Gracious Majesty,
by the
Worshipful Master M. F. DAVIDSON, Esq.
and the
Brethren of the Lodge Zetland in the East
No. 748.

In the presence of the Governor of the Straits Settlements and many of the British and Foreign Residents of Singapore.

J. T. Thomson,
Architect.

There were also deposited some silver money, consisting of a crown, half crown, shilling, six-pence, penny, halfpenny, farthing, a rupee, half and quarter rupee, besides copper coins which consisted of a penny, halfpenny, farthing, eight and sixteenth of a penny; an anna, half and a quarter; a cent, half and a quarter cent; Statements of the Trade of the Straits Settlements, together with Statements of the Revenue and Charges; and further a copy of the original edition of Horsburgh's Directory, copies of the "Free Press", and "Straits Times" Newspapers and of the "Journal of the Indian Archipelago and Eastern Asia," also a plan of the Town of Singapore.

I accompanied the Governor's party on his return to Singapore, having been invited to Government house to be present at the ball and supper given in honor of her Majesty's birth-day. I was glad of this opportunity to return for medical advice, as my sickness had again attacked me; in Singapore the affairs of the Light-house also demanded immediate attention. Captain Stewart at an early period of the operations had reported the difficulty of managing two tonkangs (lighters) in the heavy Sumatras that he was forced constantly to encounter, in which the tongkangs, besides plunging under the stern of the vessel, fouled against each other; he therefore suggested that it would be better to have one large tonkang and he would take on board sufficient for another load in his coal hole and hold, which were not required to be filled with firewood for the engines during the short trips out and in; by this arrangement he suggested much more materials would be conveyed out, and be at the same time executed with less trouble to himself.

In pursuance of Captain Stewart's suggestions, I had requested the contractor to prepare a lighter of the required dimensions, but learned that so far from having taken any steps to that end, he had annulled the contract that I had entered into for one, the last time that I had been in Singapore. The contractor's desire now became more apparent than ever to evade any expenditure, for reasons which soon became apparent, viz. that he might carry off to his country as much as possible of the advances that I had paid him out of the Light-house funds. I therefore determined, as empowered by the terms of the contract, on my return to Singapore to purchase a lighter and rig and deck her in a manner fit for the service, as much delay in the transporting of the materials from Singapore and Pulo Ubin to the rock, would otherwise have occurred.

The laying of the incomplete courses of the foundations now commenced and were nearly finished by the end of May; it therefore became of much moment that the courses prepared at Pulo Ubin should be quickly transported, but on visiting the quarries for the first time that I had an opportunity since the commencement of operations, I was disappointed to find that only 5 or 6 had been prepared. The stone-cutters had been doing absolutely nothing. Their head men complained of not getting any advances from the contractor which rendered them unable to proceed with their respective agreements. They had already had 4 months to prepare what they had done and as only other 4 months remained of our working season it appeared evident that were the works to proceed at this slow rate the building would be barely above the foundations at the end of the season. I was satisfied that I had advanced more than sufficient to cover all work done, so that if the contractor were really unable for want of money to meet his engagements, he must have been using the advances for his private purposes. I therefore now made up my mind at an early opportunity to take the contract out of his hands, being fully empowered to do so by the terms of the agreement; this step, although it would give a great deal more trouble, would at all events prevent any of the public money entrusted to my charge, being expended in any other manner than in the building of the Light-house tower. The men that he sent out to the Light-house constantly complained of his not paying them; they were themselves of the worst description and were extremely unruly and idle; and as he furnished them with food, the badness of it was a constant source of complaint and annoyance at the rock. On the 28th of May the buoy that we had moored off the rock disappeared; it had been laid down for the purpose of making fast the gun-boats to it, so that it would be unnecessary for them to cast anchor, but the commanders found that the buoy was always running foul of their vessels in the eddies and contrary currents that prevailed, so that they preferred dropping their anchors to mooring at it, and its loss was consequently not repaired.

I returned to the rock on the 2nd of June, having in a measure got rid of my attack of illness, and visited the Pulo Ubin quarries in the way. On the same day his highness the Tomungong of Johore visited the rock, accompanied by 30 of his followers. He is the most powerful native chief in these parts, allied to British interests. He remained at my house for two days, employing his leisure in fishing, to which sport he is greatly devoted; he and his followers were very successful with the hook and line. He would have made a longer stay had not the mosquitoes been so numerous, a singular circumstance, seeing that the rock is so exposed to all winds. At first we were unable to account for the troublesome phenomenon, but soon found that they bred in immense numbers in our water barrels. The first water that we had obtained had not been spring water, but was obtained from a running stream, which had contained the germs of the insect; they now issued from these barrels in millions and infested every nook and corner of the houses and chinks of the rock, neither night nor day brought any relief from them, it was almost impossible to sit, and the only refuge, if rest were required, was under the mosquito curtains. These his highness had not brought, so he did not stop to experience the tortures of another night. At first flies bred in great numbers, this I ascribed to the filthy habits of the stone-cutters and to the saltfish and half decayed preserved vegetables that they were constantly laying out to dry, but they disappeared greatly after the departure of the stone-cutters. To alleviate the sufferings of the men from mosquito bites, for they, being without curtains, could not obtain sleep at night, I caused all the bung-holes of the barrels to be constantly kept shut and the water when wanted to be drawn by a small plug hole below; in time this perceptibly decreased their numbers but not entirely. The strong winds of the S. W. monsoon which was now setting in also blew our tormentors away and only on calm days were their irritating bites afterwards much felt. On the evening of the 3rd of June, the Tomungong took his departure. He came in a beautiful fast sailing sampan belonging to the Governor of the Straits Settlements which was rigged with graceful latteen sails. About ten other small sampans composed his fleet, which with their mat sails as they stretched over to the coast of Bintang, produced rather a picturesque effect. The Singapore sampan is famed over the world for its fleetness in either pulling or sailing; manned with the orang laut (men of the sea) they have successfully competed with the fastest gigs or wherries from England, brought out on purpose for the contest.

On the 10th of June I set sail on board the "Charlotte" for Singapore. The slackness of operations at Pulo Ubin now began seriously to interfere with the operations at the rock requiring immediate attention. My illness also had returned as bad as ever, the rock now seemed inimical to me, but during my after residence on it the sickness did not again return, and the illness was probably caused by the great exposure that we experienced during the first fortnight's operations, when we were exposed from morning to night to the sun's rays. During the whole of this month little was done at the rock, this was mostly owing to the absence of the "Hooghly" on other duties which prevented our getting any stones from Pulo Ubin. For a considerable part of the month the number of Chinese did not exceed 10, who, with 4 convicts and 6 Malays made 20 workmen on the rock, during April and May the number on the rock some times exceeded 50, nearly 40 of whom were Chinese. What with the misbehaviour of the commander and crew of the "Nancy" and the absence of the "Charlotte" for repairs, we were frequently on short allowance of water; twice we had only 3 days in store, and what added to our anxieties was the unruly and bad temper of the Chinese who were but ill affected towards their situation. As there was room to stow boats, by which, in the event of any serious accidents happening to our tenders, we might send for succour, I had long considered it a desideratum to have these boats to convey the men in case of such accidents and no succour arriving; but so long as the Chinese remained there against their will, and were kept close prisoners, the placing of boats on the rock was not to be thought of. The period of the junks returning to China was during these months and they sail close past the rock; such an easy communication with these junks, as boats would have afforded would under the circumstances, have been too tempting not to be availed of whether by force or by stealth. Now that the number of the Chinese had been reduced I was determined on my return to Singapore to place our working operations on a more satisfactory footing by engaging and paying the men myself, whereby I would obtain that influence over them that I found was absolutely necessary the responsible officer in charge of an undertaking like this should possess; this to be obtained if possible by amicable arrangement with the contractor or without that, if requisite. Afterwards on the men being engaged by myself I brought out boats to be always kept in readiness on the rock; this step made the position of the dwellers on the rock more secure and did away with the occasional anxiety, when water and provisions became scarce, as to the possibility of being left to starve.

On my arrival in Singapore I communicated with the contractor but I had little satisfaction. I had already advanced 620 Spanish dollars beyond what I should have done according to the terms of the contract and he expressed his inability to advance the works any further. As yet the lowest course of the building had not been laid; I therefore called his security who with the contractor at length agreed on the 13th of June to my carrying on the works on their responsibility. With this view the accounts of the various sub-contracts were to have been furnished me, but on the 14th the contractor absconded. It was in a few days found out that under pretence of going to Pulo Ubin he had proceeded to the Eastward in a palankeen, but instead of going to the place indicated, he shipped himself on board an American vessel bound to China; it further quickly came to light that a few days previously he had bought goods to the extent of several thousand Spanish dollars from various Singapore merchants, which he had dispatched on board that vessel before proceeding himself. On estimating the value of the works done and the advances made to him I found that I had advanced the sum of 2,620 Spanish dollars, and that what with the courses ready to be shipped at Pulo Ubin and the working tools, also the extent of work done at the rock, with houses, sheds, &c., they must have cost him the sum of 2,500 Spanish dollars, so that he could have taken but little away with him of the Light-house funds. On making enquiries as to the causes which had actuated him, I found that he had the year before, at a period he was unconnected with the Light-house operations, made an attempt to get away with a quantity of goods he held on credit, but having informed his wife of his purpose she had disuaded or prevented him; this time he left without leaving a clue to his motions with any one, and it was a month or two before any thing certain was heard of him. It appears to me that from the first he intended to take advantage of the credit with the merchants which his connection with the government gave him, and this will account for the lax and off-putting line of conduct which he pursued in carrying out the contract and for the apathy and indifference with which he looked upon the misconduct and dilatoriness of his men and the loss they thereby occasioned to him.

The carrying forward of the works in all their details were now thrown entirely on my hands. The contractor's security, being a trader, expressed his inability to assist me with regard to procuring workmen or materials, he could therefore only abide the issue of the operations, and it would depend on the government whether or not he would be held responsible should the cost exceed the sum of the contract. Though I could not expect to get things done so cheaply as the contractor did, particularly in engaging workmen, yet I anticipated that I could purchase materials on as favorable terms, but in this I was mistaken. On calling all the stone contractors together I found they had combined, and they knew now that as the season had so far advanced that I must either give into their terms, on stop the works for the season. While they had been contented with 6 dollars per 10 cubic feet for dressed granite from the contractor, they now demanded 10 dollars from me, but after a weeks treaty when I could not put off the works any longer they consented to contract at the rate of 8¼ dollars, thus in the most important article an addition of expense was unavoidably incurred of 41 per cent. On the other principal item, bricks, the contractor had procured them at 18 dollars per 10,000, the same person from whom he obtained them now would not charge less to me than 25 dollars. While I reluctantly subscribed to contracts at these prices, I afterwards found the good prices were of service in expediting the work by attracting large bodies of workmen, particularly to the Pulo Ubin quarries. These men now and till the end of the season continued busily employed on the 59 courses which compose the shaft of the tower and 9 of which only were fully ready for shipping by the middle of June, at which time the contractor absconded. Thus while the contractor had only 20 men at most employed at the quarries, 80 to 100 men were now constantly at work, and though they showed great wariness and suspicion at first, their confidence was soon gained by fair dealing and prompt payments. In the 6 months that had elapsed since the signing of the contract while 9 courses had only been fully completed and 6 more partially so, during the remaining 3½ months of the working season we prepared at Pulo Ubin 44 and built 59 on the tower.

Though I had also to engage Chinese workmen to go to a spot that had now gained a bad reputation amongst them, circumstances soon altered for the better, so that before one month was over, the best men offered their services to go out to the rock. Indeed at this period the most wretched and miserable looking beings would only be induced to go and with their help we made but sorry work of it, yet, when they returned on a day or two's leave to Singapore at the end of the month, the accounts of good treatment and high wages which the improvement in their appearance amply testified to their countrymen, soon induced others to apply and we had no trouble on this score afterwards.

The usual wages for good coolies (labourers) in Singapore are 4 dollars a month. I never required to engage them at above 5 dollars, they finding themselves in food, but I made this further proviso, that on their proving to be well behaved and otherwise good workmen, they should be paid at the rate of 6 dollars a month. The masons I engaged at 10 to 13 dollars a month, carpenters at 9 to 11 dollars, stone cutters at 12 to 13 dollars, all providing their own food. This arrangement avoided constant disputes as to quality which would inevitably have taken place. They were only engaged for a month, after which period they could demand their discharge. Each man carried out with him one month's provisions. They received ½ a month's advance in money at Singapore and though they were but poor people of the lowest class, and entirely unknown to me or to the people in my establishment and though they might have absconded before proceeding out to the rock without the possibility of my being able to find them, yet they were always firm to their engagements and nothing was lost during the progress of the works by the dishonesty of the labourers.* The contractors for stone dressing, who were all poor people, were also strict to their engagements. I was forced to advance to them 100 and 200 dollars at a time, although their characters were entirely unknown to me, yet in no case did they abscond or fail in their engagements. Of these there were generally 13 or 14 persons either of the Kheh or Aya Tribe of Chinese. Thus while the first arrangements were made with a good deal of trouble and at considerable sacrifice, the after progress of the works went on as rapidly and satisfactorily as I could wish.

On the 23rd of June, the "Hooghly" arrived at Pedra Branca with a tongkang in tow and she remained on the service for nearly 2 months at this time.

The absence of a contractor now required that I should pay more attention to the carrying out of arrangements in Singapore, as well as looking after the stone cutters at Pulo Ubin. I was necessarily much absent from the rock on business at these places during the 3 succeeding months of July, August and September. I proceeded out to the rock on the 30th of June and remained there till the 6th of July. On the 29th of June the first entire course had been laid, and after this the building of the tower became our most important operation. On the end of June, 2 entire courses had been laid. On the 5th of July the wind blew strong at S. W. creating a heavy sea, so that when the Steamer with the tongkang in tow arrived off the rock, they were forced to put back to Romania for shelter. On the 9th of July the wind blew strong from the south so as to render the landing of materials a matter of great difficulty. On the 12th a considerable swell broke on the rock, making the rock unapproachable excepting on one part of the north side. By the end of July we had built 11 feet of the tower above the foundation. I was again at the rock from the 29th of July to the 4th of August. During this stay I found that the bight on the north side of the rock afforded no shelter to the tongkang alongside the wooden pier that we had built; the waves caused her to strike heavily against either the pier or adjacent rocks, and the warps by which she was on all sides fastened continually gave way, when strained by the influx and reflux of the water at each wave. I therefore fixed upon a spot out of the bay in rather deeper water where I saw that the motion of the sea though greater perpendicularly was not so horizontally, and with what few spars we had on the rock, erected a jetty supported by shears. On these shears a stage was fixed at half their height, and the stones were landed by tackle attached to a spar, thrust outwards over the intersection of the shear poles. This answered our purpose for a few days until the arrival of the gun-boats enabled us to procure more spars, with which I instructed Mr Bennett to make a pier on the same plan sufficiently substantial to last out the season.

---

* During the progress of the works, as I had direct agreements and necessarily much personal intercourse with individuals of nearly 10 different tribes or nations, I could not help remarking how honest the labouring poor are; whatever be their caste, colour, religion or the place of their nativity, their virtues in this respect stand equally out in bold releif.

It was only on rainy days that they showed symptoms of disobedience, or when they had to work in situations exposed to the wind. The cold air they could not endure, this was no doubt owing to the pores of their skin being kept open by the constant copious flow of perspiration during their working hours. If the thermometer sunk to 75° or 76° they seemed miserable when exposed to the wind. True, this circumstance was one of their disadvantages, but of heat they never complained,—exposed to the full influence of a tropical sun they laboured vigourously where an European would have sunk.

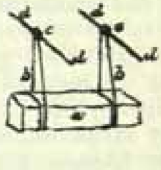
By the end of August, 21 feet of the tower had only been built and up to the 23rd course only landed; this was owing to our not having the means of conveying the materials fast enough from Pulo Ubin, where the works were now carried on by the Chinese rapidly and with great spirit. On the 17th of August we lost the assistance of the Steamer, she being required on other duties, and during the rest of the season she made only one or two trips to the rock. For the conveying of the rest of the materials therefore we had to depend on the 2 gun-boats and one lighter; this duty the fresh and steady southerly breezes of September enabled us to accomplish more rapidly than we expected. An exception to this favorable weather took place on the 16th of that month when strong westerly winds blew all day, commenced by a heavy Sumatra. Both gun-boats had arrived off the rock but could not communicate and were forced to run under the Malay coast for shelter. By the latter end of September the sea became smooth and winds light, south and south-east generally. A great deal of thunder and lightning prevailed. By the end of September we had built 47 feet of the tower above the foundation courses and had landed 52 courses. I went out on the 29th of the month and remained till the 4th of October. I returned again to the rock on the 14th, and remained till it was deserted on the 21st of the same month; when we had built 59 feet of the tower above the foundation courses; this completed the shaft as far as the capital of the tower.

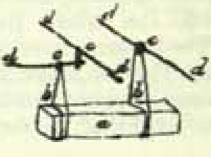
During the months of August, September and October, the number of workmen employed on the rock numbered 30 to 35. They were as follows—2 to 4 bricklayers, 1 stone cutter, 1 carpenter, 20 coolies, all Chinese, and 6 Malay lascars. No material accident happened to any of the workmen. One day a providential escape was experienced by several men; while hoisting the upright beam of the derrick crane; the tackle falls gave way and the whole fell down several feet, precipitating at the same time several of the lascars who were standing around it. The system of paying all the workmen myself possessed great advantages, and we now found them as obedient and tractable as they had formerly been fractious. Personal chastisement was never inflicted and in fact never called for, an occasional threat of cutting their pay on the symptoms of idleness being effectual in all cases. There was also no difficulties made about water during the progress of the building, the men could always have a bathe, in the fresh water before it was mixed in the mortar; this appeared a great relief to them. The natives of these parts seem to be acutely sensible to the want of regular and copious ablutions. The conduct of the commanders and crews of the gun-boats and lighter (the latter sailed by a Malay) was perfectly satisfactory; no appearance of mutiny or dissatisfaction arose at any time amongst them; their respective duties were labourious and required constant and severe exposure to the sun, the great enemy to exertion in this climate, and though they could by no means be considered so effective as Europeans, they accomplished the ends required perfectly well in their own modes and ways. By the end of the season the "Nancy" had become so crazy and leaky that the serang (a Malay) who was then in charge good humouredly told me, that he would patch the holes in her sides with China paper, till we had finished the operations of the season. The planks of her stern were so rotten that the jolly-boat attached had run her stem through them. The tongkang was in a still worse state, not being sheathed, the sea worm had riddled holes through all parts of her bottom, so that when deeply loaded constant baling was requisite to keep her afloat. I was forced to buy the lighter in Singapore, bad as she was, as the contractor had annulled the contract I had made for a new one, as already mentioned. The urgency with which a lighter was required constrained me to buy an old one, which I would have avoided doing, had it been possible.

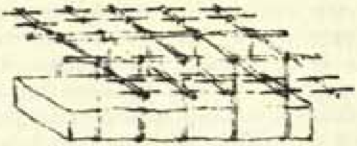
When the building operations had been put into regular routine and after each man had been accustomed to his duties, we found the Chinese to perform their respective tasks satisfactorily; the regular habits of industry which they bring from their own country does not make laziness one of their vices. Their mode of carrying weights differs from that of the English, so a short notice of this may be interesting. When one man is employed in carrying, he uses two wicker baskets constructed with rattans. These are slung on a stretcher balanced and borne on one of his shoulders. In this manner an average Chinaman will carry for long distances 70 to 90 catties (93 to 120 lbs.) and for short distances 120 catties (190 lbs.) going at the rate of 2½ miles an hour. The stones that we required for the building averaged 4 cubic feet of granite weighing 660 lbs., these required to be carried up a sloping gangway at an inclination of 15 degrees, to the height of 20 feet; four Chinese were employed to do this, each man therefore bore 165 lbs. which he did without any appearance of uneasiness. The largest stone that four men carried contained 6 cubic feet or 990 lbs., that is 247 lbs. per man; this they performed with considerable difficulty. Four men carried up the inclined plain to a height of 20 feet, one broad course of the building in 4 hours, containing 95 cubic feet and weighing 15,675 lbs.; this gives 3,918 lbs. raised 20 feet in 4 hours to each man and 326 lbs. raised 1 foot per minute; that is, a Chinaman exerts a continuous effective force of 326 units per minute, working 9 hours a day at this species of labour half the day; and at other hard labour during the rest of it; but this he did not always do, for I have observed on some occasions, that the labour done was as low as 225 units per minute. Had the Chinese been employed on contract, I have no doubt that they would have gone through double the work, though I am convinced that they could have only continued the exertion for a few days, and not for a whole season. An European raising material on the back and returning empty and working 6 hours in the day, performs 1,126 units per minute, or with a wheel-barrow on ramps working 10 hours per day, 720 units per minute. (Tait's Mechanics). This would prove the labour of a Chinaman working under the heat of the equator, not to equal half that of an European working in the temperate zone; but it will be seen that he can exert for a short time a nearly equal force, for he can bear a burthen of 247 lbs, which is the weight carried on the back of an average European, such as a sack of wheat, containing 4 bolls weighing 240 lbs; it must therefore be conceded that though the Chinese does not perform in the Torrid Zone half the labour of the European, this must not be ascribed to his possessing less physical powers, but to the climate in which he labours.

The Chinese in raising the stones to the top of the building by the winch and tackle, and working nine hours a day, on one occasion of which note was taken, performed a useful effect of only 127 unites per man per minute, and on another of 210 units per man per minute; this small result was evidently owing to the great friction in the blocks, pulleys and rope; and could we have procured a windlass, driven by spurwheel and pinion, by which the ropes and pulleys would have been dispensed with, their labour would have been much more advantageously applied and consequently more efficient.

The mode that Chinese invariably use in carrying heavy weights is by stretchers held on the shoulders, one stretcher being borne by 2 men, in this manner:—*a* the stone, *bb* slings, *cc* stretchers, *dd* where the shoulders are applied; five men occasionally place themselves to 3 stretchers thus—*a* the stone, *bb* the slings, *cc* the stretchers, *dd* the points where the shoulders are applied, *e* the point where the cross stretcher is applied, to the extra one borne by the odd person. In carrying weights the number of 40 or even 100 men may be attached by multiplying the number of stretchers, as in the figure annexed, showing a burden to which 40 men could be yoked, and who would all apply







their shoulders at the same level above the ground. The largest stone that I have seen lifted and removed in this manner, measured 12 feet long, 4 feet broad, and 2 feet deep, weighing 15,360 lbs; but I have no doubt, that greatly heavier articles, provided they were paralelopipeds or cylinders could be moved in this way. In boring granite, two Chinese bored a hole of two inches diameter and nine inches deep in as many hours, that is, an inch per hour; one man striking and the other holding and turning the jumper; 3 natives of Hindoostan performed the same work, 2 men striking and one holding and turning the tool. Two of the latter class generally bored a hole, one inch diameter and two feet deep in a day's work of nine hours; this is a poor result when compared with English labour in Europe, if the data given by Sir John Burgoyne (Weale's series) be correct, where it is stated, that two Englishmen bore 4 to 7 feet of 2 inch holes in a day, and that 8 feet of 1 inch bore is accomplished by one man per diem.*

During the period of our operations we had some opportunities of observing the manners of the Chinese lower classes, though not so intimately as to enable us to form a thorough conception of the genius of that people. They appear to be devoid of religious prejudices; in their food they are not particular, eating whatever is palatable, and sometimes what Europeans would think sufficiently disgusting; rice, salt-fish, sour crout, and occasionally pork formed their diet. Frequent applications were made by them for our medicines. Plasters and salves for the ulcers, that they are much subject to, were held in great request. The taste of castor oil they highly relished. I can say little of their healing arts, further than that when they attempted this themselves they seemed to put much more faith in external applications than internal remedies. On one of our carpenters being afflicted with headache, an old man having some pretensions to medical skill, first distended the veins of the temple, by rubbing the finger against them, and then punctured them in several places with a needle, this seemed to afford some relief; on occasions of griping of the stomach, he would throw the patient on his back, and catching hold of the skin of the abdomen, by means of two small pieces of money, held between his finger and thumb, he would twitch at the part till it was perfectly raw; other parts of the body were then treated in the same manner, principally in the neck, shoulder blades, and spine; to us the remedy appeared greatly more severe than the disease, and the person operated upon, by his wincings and contortions under the process evidently held the same opinion as ourselves. When fighting they do not use the fist in the manner of the labouring classes of England, nor do they stand up to the contest. They tear and scratch with their long finger nails, and if urged to ungovernable fury they will dig their two fore-fingers under the ribs, and sometimes occasion instant death by the rupture of the spleen. They are notorious gamblers, and their amusements are mostly of a sedentary nature, the climate holds out no inducement to active sports, so they seldom indulge in them. In their trials of strength their most common test is by the two persons holding the opposite ends of a stout pole, which they push against each other until one gives way. They well understand the power that combination gives them, and are adepts in the minutiæ of regulating their intercourse with each other, when carrying out undertakings in which each has a common interest. For the estimating of the moral qualities of the labouring classes of Chinese, it seldom falls to the lot of the European to be placed in a position to judge fairly, as he comes in contact for the most part with those belonging to sea-port towns, who it may safely be assumed do not come up to the standard of the nation generally. The agricultural classes, of whom little is known, will no doubt be greatly more estimable than those. I had frequently observed scars of small wounds near the navel and supposed that these had been occasioned by puncturing the part, in the manner of the Japanese as described by Kaempfer, but I was informed that the scars had been made by their parents, by burning during infancy, but for what reason they could not tell me.

---

* In the account of the Skerryvore Light-house, page 118, Mr Stevenson informs us, "In boring holes of 1 to 1¼ inch diameter, it may be observed that they are "generally done with the hand mall by one and the same person striking with the "mall with one hand and turning the boring tool for himself with the other and in "most cases a man will bore 9 or 10 inches an hour in granite rock. If the bore "be 1¼ inch diameter, as for plugs, three men will generally bore two plug holes in "an hour, each hole being 9 inches deep. If the bore be for blasting and of 2 to 2¼ "inch diameter, three men will bore at the rate of one foot per hour to the depth "of 6 or 7 feet." How inefficient is the South Eastern Asiatic in this department!

The Chinese are noisy and talk long before they come to blows, but in the latter part of our operations this trouble was easily put a stop to.

As the building rose we could the further see into the waters that surrounded us. During neap tides the water was perfectly clear and displayed in its bosom numerous fish of various species playing about the rocks and corals. A beautiful green species, particularly attracted our attention from the splendour of its tints; the colours of others were various, purple, blue, and yellow, and other brilliant hues, were not uncommonly seen to adorn the finny tribes, others were spotted and striped. The gigantic skate called by sailors the devil fish, would sometimes approach close to the rock, and might occasionally be noticed to leap out of the water, and make a summerset 20 feet above its native element; turtles on rare occasions would be seen moving along the bottom or lying sluggishly on the surface of the waters. Horsburgh in his Directory notices the numerous oysters that are to be found on Pedra Branca, but seven days after our landing it was difficult to find a single one; the Chinese made an early finish of them. We found also one or two of the large bivalves called the Gebang on the rock, this species is sometimes to be seen 4 feet in length in Singapore. Many shoals of porpoises were to be seen at all times, and the ugly and ferocious shark was seldom absent; I have often watched his movements as he stealthily moved along the bottom; his approach was beheld with consternation and confusion by many of the small tribes of fishes, who would dart in all directions and hide themselves under the stones and in the crevices of the sunken rocks, and yet by others he was received with the greatest nonchalance, and in the midst of whom he would unconcernedly move without attempting their molestation. The sword-fish was also a constant visitor to the waters of Pedra Branca.

On the 15th of October a considerable swell set in from the north-east, this continued till the 20th, when it set in still heavier; on the 21st we had finished all the work that could be done at the tower, so we made preparations to depart. The swell was now so heavy as to break over the East rock about 7 feet above the level of the sea at high water and the approach was difficult for our small boats; I therefore sent all the Chinese on board one of the gun-boats at noon, lest by their helplessness on the water, we would not be able to get them off, should the afternoon bring a heavier sea with it. I remained with the crews of the gun-boats to stow away all useful materials in the tower, also to take down our house, and that of the Chinese, lest by catching fire or being set on fire by the natives in our absence, it should scorch and splinter the face of the walls. We left the boat-shed, blacksmith's shed, and coolies-shed standing, as their materials were of no value, though we did not expect them to stand the force of the coming N. E. monsoon. We also took up and stowed on the top of the rock to leeward such parts of the pier as could be removed, the rest of it we left to its fate. A day or two previously we built brick pillars on various parts of the rock to test the force of the waves and the height to which their influence might extend up the rock. At 5 P.M. everything was accomplished, so we shoved off from the rock and took our departure for the season. The H. C. steamer "Nemesis" passed the rock a day or two later, and her commander reported a heavy sea to be breaking on the rock, so as to render landing impossible.

PART IV.

Occurences of 1851.

Rock visited at various times during the North-east monsoon.—State of the rock, and works after the monsoon.—Re-land on the rock to commence operations.—Chinese junk wrecked on Stork Reef.—Commence on south pier and description thereof:—Mode of removing stones by floating with barrels.—Rain channels for collecting water—Mr Church visits the rock.—Redress the outside of the building.—A large barque seen on Postillon shoal.—Arrival of light apparatus and hoisting thereof.—Shears described.—Smeaton's account of hoisting the dome of the Eddy-stone.—Barque "Metropolis" wrecked and water-logged.—Col. Butterworth and party visit the rock to witness its lighting for the first time:—Description of light and apparatus, also of lantern.—Light first permanently shewn on 15th October.—Unsuccessful attempt to land on 1st November.—Survey of rock and vicinity.—Leave for the season.—Atmospherical disturbances.—Water spouts and squalls described.

During the North-east monsoon, when our operations at the rock were necessarily suspended for the season, the stones of the capital of the tower and flags for the floors were proceeded with at Pulo Ubin. In Singapore, the doors, windows, stairs, furniture, &c., were commenced upon and prepared before our returning to the rock.

The rock was at various times visited during the North-east monsoon, both by myself and the Gunners of the "Charlotte" and "Nancy." On the 26th October the "Nancy" proceeded out, but on fetching the rock the Gunner in command could not venture to land; however next day she went out again and a landing was effected. The "Charlotte" proceeded out on the 2nd November and got abreast of the rock on the 4th, but the Gunner could not effect a landing. On the 5th the sea had gone down and become quite smooth, so she went out again when he landed with ease. On the 11th she went out again but a heavy swell and squally weather from N. E. prevented landing.

I proceeded out on the 23rd of the same month on board the "Charlotte" and landed with ease on the 24th; there was a swell from the North-east. I found nothing carried away from the rock, but all materials remained as we had left them. The ebb tide in the evening we found so strong that a jolly-boat propelled with 6 paddles could not make head against it. I proceeded out again on board the same vessel on the 9th December, and on the 10th could not get out to the rock, owing to the heavy sea and strong N. E. and northerly winds and squally weather, so put back; I went out again next day but experienced the same weather. We approached within ½ a mile of the rock on which the sea was breaking heavily. We observed that the landing pier, boat house, and north brick pillars, that we had set up before leaving, had been washed away. It was remarked that inside the Straits it blew N. N. W. while outside the wind was from N. E.

The waves from the hollow to the crest were 7 feet high* and were short and trying to the masts. On the 7th of January I again proceeded out on board the "Charlotte" but did not get close up to Pedra Branca before ½ past 9 A. M. of the 9th; I went in the jolly-boat within a few yards of the rock, but could not have landed without endangering the boat. I proceeded out again on the 28th of January, but found the sea too high to attempt landing. On the 15th of March it was noted that the sea in Singapore roads was perfectly smooth, which proved that there could be but little sea on out at Pedra Branca. I proceeded out on the 27th of the same month and landed on the 28th, there was a breeze from the North-east, but only a slight swell. We lay at anchor off the rock for two days, and completed a shed for the workmen for the coming season. The following was the state of the rock when I landed:—The pier was entirely washed away, the wrought iron bats by which it was fixed to the rock being either drawn or broken off. Two stones weighing 640 lbs each, we found washed off the rock, and deposited in hollows below, they had been placed on a spot 6 feet above high water spring tides at the time we left. The boat-house, coolies-shed, and lime-house, were entirely washed away, these were 6 to 10 feet above high water spring tides at their foundations. The sand and red earth with enclosures were also washed away, also all the pillars on the north exposure of the rock, placed 10 to 12 feet above high water spring tides. On the south side of the rock parts of the water racks and shed were broken down, these were 15 feet above the sea. There was evidence of a heavy spray having washed over the East high rock 20 to 27 feet above high water in the damaged state of the bath house and water drains upon it. The pillar on the western part of the rock was much worn, this was at a height of 12 feet above the sea. All stones of less than ¼ of a ton weight left on the North side of the rock were either washed off into the hollows or carried round to the lee.

At this time when lying off the rock a considerable swell got up which rendered landing or departing difficult, neither could be effected without wetting up to the middle. In getting underweigh the "Nancy" barely escaped ship-wreck, by being set on the rock by the wind and current. A sea weed was found covering the rocks on the North side to the height of 10 to 12 feet which shows how constantly the waves had played on this quarter. The base of the Light-house and materials round it were unaffected, and if anything had gone over here it must have been only spray.

During the first year's operations it struck me that a convenient platform might be constructed near the entrance of the Light-house, which would be useful for laying articles, on their being about to be hoisted into the Light-house; it would also form a small promenade for the light-keepers and if partially covered with awnings would serve for a sitting place, where they might take their victuals. Below the platform might be constructed a vault which would be useful for stowing lumber, heavy articles or extra water.

---

* This was ascertained by placing the eye at a certain known height above the water line, and when the vessel was in the trough of the sea noting when the horizon just and no more than disappeared from view.

The unsightly gully to the west of the Light-house appeared to me to be easily transformable into a garden by filling it with earth and in which the more hardy plants might be made to grow; these it was hoped would form a subject of interest and recreation at the rock, where the position is so lonely and employment so monotonous.* At my several visits to the rock during this north east monsoon, I carefully watched the action of the waves upon the rock and saw that could a pier be stretched beyond the breakers a landing could probably be effected on it at all times, excepting during the worst of weather; as the case stood, without a pier it was difficult to land at any time except when the sea was nearly calm. These proposed additions I brought to the notice of government and a ready sanction was obtained for their execution. The garden and platform walls I designed should be built of granite, laid in rusticated courses, but I did not fix on any plan for the pier until I should have had a better opportunity of considering the subject after landing on the rock, to commence this year's operations.

The "Nancy," which had been thoroughly repaired, I sent out with Mr Bennett, accompanied by the tongkang loaded with attaps and planks, on the 5th of April. They arrived at Point Romania at 3 A. M. of the 6th, here they landed convicts, ten in number, who built a hut for themselves, as they were to remain to cut wood and dig wells. The "Nancy" and tongkang proceeded out to Pedra Branca and arrived there at 6 A. M., of the 7th, when Mr Bennett landed and took up his quarters in the Light-house with 1 blacksmith, 1 cooly, 2 carpenters and 6 lascars; having landed the materials the "Nancy" and tongkang left the rock for Romania. It may be here worthy of note that the blacksmith, a Chinese, was the same man that had such a fright the season before, when left on the rock, and who then when brought off behaved in so unmanly a manner. Though he was an opium smoker I had known him to be a good workman, so had employed him on his return to Singapore on various work during the whole period of the N. E. monsoon; as time wears off most impressions, he asked to be employed again at the rock, but this I was rather doubtful of acceding to, reminding him how he behaved the season before. He seemed in earnest and promised not to be afraid, so was engaged. Though he landed this season at the same period as last year and this with nearly equal difficulty, he showed no signs of timidity, but immediately on landing set to work in building his forge, shewing by his assiduity that he was in good earnest, and he continued in the employment the whole season till all was finished.

---

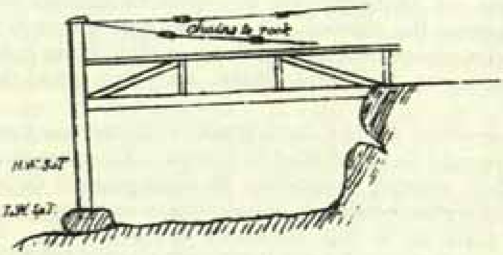
* It has been already noted that my intentions were rendered futile by the sea during the North-east monsoon; no plants could be found to grow—J. T. T. July, 1852.

I left Singapore on board the "Charlotte" on the 7th, and arrived at Point Romania via Pulo Ubin at 5 P. M. on the 8th; we sailed next morning in company with the "Nancy" and tonkang, which were by this time loaded with water and spars, carrying also the convicts, and arrived off the rock at 6 A. M. In the early part of the month the sea was tolerably smooth but a considerable surf afterwards arose and broke on the rock until the 14th, when it subsided. Neither the wind nor sea, fortunately, were any way nearly so bad, as at the same period of last year.

The convicts on landing were set to blast away by gunpowder some rocks at the north landing place, and the Chinese and Malays were busied about the houses and sheds for ourselves and workmen. On the 12th a Chinese junk struck on Stork rock and immediately bilged and filled, the crew were taken off by an accompanying junk, who assisted in saving as much out of the wreck as they could, apparently for their own benefit for they made off with the spoil leaving three of the owners of the cargo clinging to the wreck. These were rescued by a Malay sampan who promised to take them to the gun-boat which was lying at Diana cove, but instead of which, they carried them to a barren rock where they landed them and then proceeded to rifle from the remainder of the cargo what they could carry away. On the wreck being perceived from the "Nancy" her gunner sent his boat and found the 3 Chinese on the rock, whom they took on board and brought to Pedra Branca. They remained on the rock with us that night, but seemed very uneasy in their minds, and one threatened to destroy himself. Next day on the arrival of the "Charlotte" I sent them on board, as I was about to embark in that vessel for Singapore viâ Pulo Ubin. They appeared to have great distrust of our intentions, so that when we dropped anchor at Pulo Ubin one of them jumped overboard, crying out at the same time that he would drown himself, but on plunging into the water he kept his head very buoyantly above the surface, till the boat was sent to bring him back. The circumstance of our touching at Pulo Ubin before proceeding to Singapore had most likely, also, stimulated their suspicions.

At the village in Pulo Ubin a countryman of theirs was found, with whom they begged to be allowed to depart. This was gladly acceded to, as they showed themselves so little grateful for our assistance, and otherwise rendered themselves so troublesome by their unfounded fears as to our intentions towards them. On leaving, as they were destitute I gave them sufficient to carry them to Singapore and to maintain themselves for some days, but at the same time let them understand that their conduct had been any thing but pleasing. They were natives of Hainan where the people of the coast are barbarous, and have treated in a wretched manner such European wrecked seaman as have fallen into their hands, it is not improbable that they took it for granted, that we would be as bad as themselves and their countrymen, so could not appreciate any act of kindness by which I did my best to alleviate their distresses. On the 16th at Pedra Branca the swell set down heavily again from the north east, so that materials could not be landed and the tongkang had to run for shelter for two days to Point Romania. On the 22nd of April we commenced cutting the foundations for the platform and outside vault, and in paving the Light-house floors. There were at this time 42 workmen on the rock, viz. 2 Chinese bricklayers, 7 Chinese stone-cutters, 2 Chinese carpenters, 1 Chinese blacksmith, 14 Chinese coolies, 6 Malay sailors and 10 Convicts.

We also commenced to cut a square hole in a heavy stone weighing 5 tons out of water, which I designed for the foot of the south pier. The pier may merit some description, as on it was to depend the possibility of landing during the N. E. monsoon. I had carefully considered the merits of two propositions, which were, whether to construct for the purpose of landing during the north east monsoon, a small harbour of stone or a pier of wood. The former I intended to have enclosed from the sea excepting at the outlet by walls or piers of heavy stones, which we would float by barrels to the spot, from other parts of the rock, and build one on the other by means of heavy shears, and strong tackle; but the objections to this plan appeared to be in the expense, and probable failure of the enclosing walls, during heavy weather; the time required for its execution would also be longer than we could afford. A wooden pier was consequently adopted as the easier in construction and cheaper in cost, and as being more easily repaired in case of damage. Many principles of construction for the pier presented themselves as feasible, and I at length fixed upon what I considered the most simple, which at the same time opposes the least material possible to the action of the waves. The plan of it will be seen in the plan of the rock, (see annexed plate) and the elevation is here given. It may shortly be described as being composed in its main features of 2 strong beams of the best and most durable



wood grown in Singapore, called tampeny. One beam 25 feet long and 14 inches square is upright and whose foot is let into the stone above mentioned, to a depth of 12 inches; this stone is laid with its upper part on a level with low water spring tides. The other beam stretches horizontally from a projecting rock to the upright; to the former it is fixed by dovetail bound further by copper bolts let into the rock, to the latter by a notch over which passes a strong wrought iron strap, 4 inches by 1 in scantling, secured by several wrought iron screw bolts to either beam. That part of the upright immersed in water is protected from the sea worm by copper sheathing. On the horizontal beam are laid small battens transversely, at 7 feet distances, which are bolted thereto by wrought iron screw bolts. These battens bear the pathway, which is 2½ feet broad, and laid with 2½ inch planks of tampeny. The planks are laid ½ an inch apart, so that the water falling on them may escape easily. On one side of the path-way is a wooden railing, supported by short posts; from the upper part of these posts, struts extend to either end of the horizontal beam that bears the path-way, and serve to strengthen and render it nonelastic. The whole railing is bound together in its various parts by wrought iron straps and screw bolts, both in its several joinings, and in its fixture to the horizontal beam. A light iron railing runs along the other side of the path-way. From the top of the upright beam extend two wrought iron chains of 1½ inch in diameter round bar, joined together in their several pieces by short links of the same material. On the west side of the pier one chain extends directly to the rock, to which it is secured by a wrought iron bat driven 14 inches into the rock, perpendicularly to the chain. On the east side of the pier, an out-post 10 inches square and 20 feet high is fixed into the rock by being let into a hole 12 inches square, and 10 deep. This post is connected with the inner end of the pier, by a horizontal beam 10 inches square, which is secured to the post and pier by wrought iron straps, knees, and bolts. The object of this out-post is to extend out the other iron chain, in passing it from the pier head to the eastern rock, so that it may act more powerfully in holding the end of the pier steady, when a sea breaks against it. To the end of the pier davits were fixed for hoisting a boat to. The path-way of the pier is 11 feet above high water spring tides, and as the sea is expected to come over this at times, the large boat belonging to the Light-house is not drawn up to the pier, but to the rock at a more secure position, and instead a small fishing sampan is hoisted to the davits, the loss of which, if washed off, would be of little consequence.* Around the pier all the boulders and stones were cleared away to the depth of low water mark spring tides. These boulders and stones varied in size, from 1 to 3 tons in weight, out of water; their removal was easily accomplished by attaching them to empty casks and floating them away. For this purpose holes were bored in the upper surfaces of the stones to the depth of 6 inches, and of a diameter of 1¼ inch, into these holes ring bolts of nearly the same diameter were inserted, which being flattened on one side were fixed in firmly by wedges driven hard down against the flattened side. Either one, two or three empty barrels according to size were rolled to the stone to be removed and lashed to the ring bolts with ropes, this was done at low water, and as the water rose the barrels rose also, until the stone floated, when it was easily removed out of the way. The stones were sunk at either end of the rock near low water mark; when removed to the spot where they were to be sunk the lashes were untied which detached the barrels so that these could be floated to high water mark from whence they were rolled up to a secure place on the rock. The ring bolts were obtained at low water by knocking out the wedge. The boulder on which the south peir rests at its outer end was the largest that we had to remove, this as I mentioned before weighs 5 tons out of water. It lay near high water mark so could not be floated away from its place; slide ways were therefore made of barked wood on which it slipped easily down to low water mark, on being hauled along by 2 sets of tackle. Cross spars were then lashed to the boulder, by which six large barrels were applied, and it was floated by them when the water rose, removed and sunk exactly into the place that it was to occupy.

---

* During the N. E. monsoon it was found that the pier seldom could be approached owing to the broken water around it, so a boom upheld by stays was projected from the end other 25 feet outwards. To the point of this boom a drop ladder was fixed, which hangs down to the water, and by its means landing was effected during moderate weather. During heavy weather the whole pier was immersed in the broken water and the small boat secured to it was filled and irrepairably damaged—12th July, 1852. J. T. T.

The system of floating the stones away by attaching them to barrels, was suggested to me by reading an article in the C. E. & Architect's Journal, to which I cannot now refer; we found the mode extremely well adapted to the situation, as the barrels were so easily detached and rolled on shore, before the coming on of the sudden squalls that are of frequent occurrence in the vicinity, and which, had the barrels not been detachable and easily secured, would have dashed them to pieces against the rocks. On the 1st of May, a barque apparently American was seen to run on Stork reef at about 5 P. M. and remained there till dark, when a Steamer coming from the westward was seen to go to her assistance. On the next morning she was found to have got off, and appeared in the distance bound towards China. A great deal of firing was heard for some time past during the nights, supposed to proceed from the China junks, now passing in great numbers.

We now commenced cutting rain channels around all the higher rocks, which were to guide the rain water into barrels placed to receive it. There were altogether 1,069 square feet of surface thus enclosed and whose rain fall is guided into barrels. The average rain fall at Singapore is nearly 8 feet per annum, but allowing only half this amount to fall at Pedra Branca, this would afford to the establishment 4,276 cubic feet of water during the year, or 26,725 imperial gallons. Allowing the men to consume 2 gallons each a day, an establishment 8 men would only require 5,840 gallons in the year, so that the arrangements made for collecting water, will allow of the men bathing also very frequently if not daily; this will add much to their cleanliness and comfort. On the 22nd of May the granite courses having arrived from Pulo Ubin we commenced building the capital of the tower.

On the 3rd of June we removed the large stone for the foot of the south pier, and on the 4th floated it to its place, in the manner described before. On the 9th, I for the first time descried the peak of Pulo Tingi, a high Island on the Eastern Coast of the Malay Peninsula, this was from the top of the 5th light room course. On the 13th of June strong southerly breezes commenced, creating a considerable surf on the south exposure of the rock. On the 14th the highest course of granite was laid on the Light-house, so that on that date the building was ready to receive the lantern. We now commenced fitting up the doors, windows and other fixtures of wood in the edifice. The latter end of June was very hot, calm in the mornings, with strong southerly breezes in the afternoons. We now commenced forming a road over the rocks to lead from the Light-house to the north landing place, which was done by cutting steps, laying stones across gaps, and cutting and blasting away the rocks.

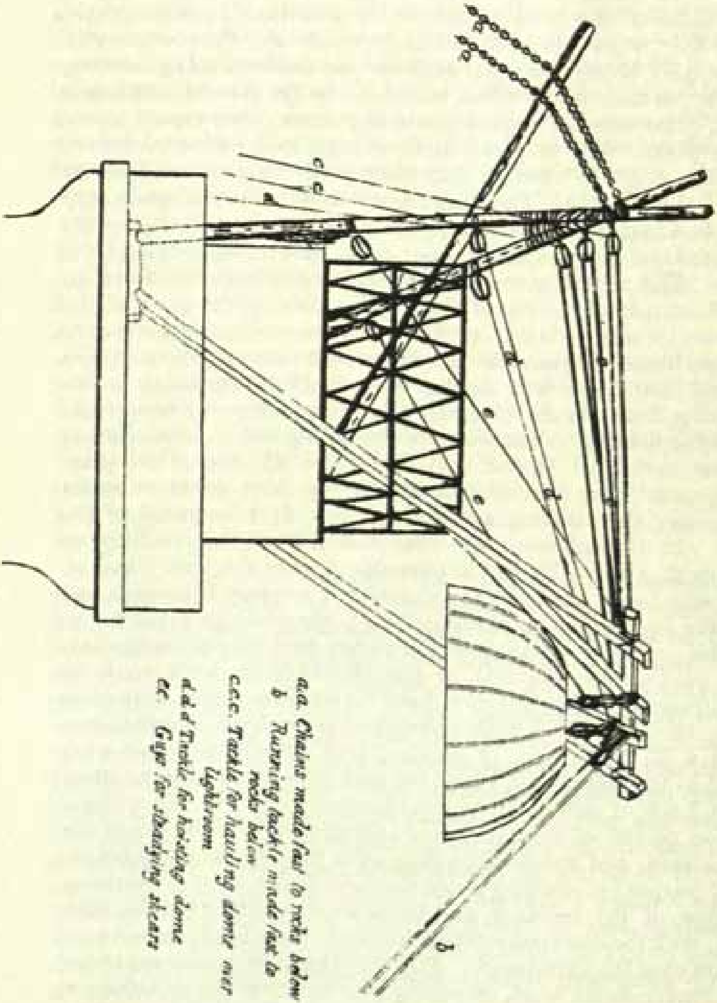
At the commencement of July, dead calms and a perfectly smooth sea were experienced. On the 8th the Hon'ble T. Church, Esq., Resident Councillor, with a party arrived off the rock, on board the H. C. Steamer "Hooghly" at 11 A.M. Mr Church and party landed and minutely inspected all the works, and on his departure at noon, he was pleased to express his approval of the building and all other operations. On the 9th I left the rock on board the gun-boat " Charlotte" for Sidili, a place on the East Coast of the Malay Peninsula for the purpose of obtaining quartz to mix with the stucco. The quartz was beaten and ground down to an impalpable powder, before mixing it with the shell lime that was to serve as stucco for the walls of the rooms. I returned on the 11th. Near Sidili, to the northwards, large veins of pure quartz were found in great abundance. On the 17th a serious accident occurred to one of the stone-cutters by the falling of a heavy stone upon his leg. As he was rolling over the stone, he lost his balance, so as to let the stone fall upon and crush his ankle. He was sent directly to Singapore and placed in the hospital, but was removed from thence by his friends, and he did not recover during the term of our operations. At the latter end of July heavy squalls from the south-west were frequently experienced. The building had been raised and built entirely without outside scaffolding, but as I found on its being finished that the outside had got much spattered by the mortar falling against its sides, we commenced raising a slight scaffolding all round it, as far as the top, for the convenience of having the entire outside re-dressed. During the months of August and September 15 stone cutters were employed on this duty. On the 4th August when I was on the top of the building a slight electric explosion took place, as it appeared to me on the shears that had been raised and set up ready for lifting the lantern; there was a heavy cloud passing over head at the time;—the explosion was not louder than the firing of a squib. On the 12th a large barque was seen lying on Postillon shoal all day, but she got off during the evening, and came up by Pedra Branca at 8 P. M. when she nearly ran on the Middle rocks; next morning the same barque was seen on the Stork reef, where she lay till 8 A. M., when she got off and tacked into Singapore Straits.

During August the lantern, machinery and apparatus arrived in Singapore, and were immediately placed in lighters on being got out of the vessels that brought them. Captain Stephens, of the H. C. Steam Frigate "Semiramis," kindly took charge of the lighters, and towed them out on the 27th of this month. He arrived at noon of the same day and after landing all the packages safely, departed with the empty lighters at 6 P. M. for Singapore. There was a swell coming in from the N. E. so that the lighters were brought alongside the pier with some difficulty; but the European seamen belonging to the Frigate, in turns with our gun-boat's crews, soon got every thing on shore, much to my relief, for if any accident had occurred to the valuable a rticles, the showing of the light would have been thereby postponed.

On the 28th we opened the packages and commenced preparing the top of the light-room wall for the sole plate of the lantern, by cutting the necessary grooves and boring the bat holes, by which the cupola is fixed to the stone wall of the tower. On the first of September, we hoisted the machine in its package into the light-room, and secured it well against damp. By the 7th we had the astragals and cornice of the lantern, which are of cast iron, hoisted up and screwed to their places; and on that day the copper dome having been joined in its several pieces and ribbeted together, we hoisted it up from outside the building, and set it on its place. The operation of hoisting the dome was executed in the same manner, with some modifications, as shown in the same operation described and figured in Smeaton's account of the building of the Eddystone Light-house, but as that publication, being on a professional subject, can scarcely be known to those not engaged in such undertakings, a short description will be attempted here.

Shears had been raised to the top of the building, with their feet resting on the balcony floor; these shears were not of the common kind, but were composed of two upright spars 33 feet long, 5½ inches square at their upper ends, and 7 inches square at the feet. These upright spars stood 17 feet apart, and were joined at their tops by a horizontal cross piece, which was notched into both and bolted and screwed to them; this cross piece was little over 17 feet in length, and 6 inches square in scantling. The shears were rendered rigid by 2 diagonal braces proceeding from the middle of the cross piece to the middle of either upright, where they were bolted at the joinings. Shears thus constructed can support a large article, such as the dome of a Light-house, close up to their head, which would not be the case with common shears, constructed of 2 spars joined together at their tops.

The shears were prepared and put together on the rock below, and when ready to raise, a spar temporarily applied was fastened at half their height. Common shears were then fixed on the top of the building, from which tackle falls depended, and which were made fast to the temporary spar fixed across the middle of the shears. The shears were then hoisted with their feet upwards, and on arriving at the top of the building clear of the parapet, the feet were canted down to their places, and being secured to their positions, the head of the shears was now uppermost. The head of the shears was drawn over the light-room by tackle stretching from thence to small shears standing on the opposite side of the balcony. The shears weighed 20 cwt. After having the shears secured to the top of the building, over which they now spanned, the next object was to rig them so as to make them ready for hoisting the dome. The duty required of the shears was to incline so far over the side of the building as to support a dome 12 feet in diameter clear of the walls; and on the dome being raised to the shear head, to carry it inwards and drop the mass quietly and correctly into the place prepared for it. For this purpose strong common shears were erected on the balcony, on the side opposite to that on which the dome would be raised, running tackle was then fixed between the heads of the two shears, consisting of 3 double blocks at either head, in which was reaved a 3¼ inch rope, (1 in. dia.) both ends of this rope were carried to the scaffolding, where the men were to stand in hoisting, so that 2 sets of men could haul at the same time. Running tackle half the power of the above was next made fast to the top of the main shears, and extended to ring bolts fixed in the rocks below, for the purpose of drawing down the main shears, so as to overhang the edge of the building, and to ease off gently when the main shears, with the dome suspended close up to their head, were drawn in again over the light-room. Two iron chains were now made fast to the hinder shears head, extending from thence to the rocks below, to which they were secured by ring bolts. The link bars of the chains were ½ an inch in diameter. All the above having been hauled taut, two tackle falls consisting of double blocks, with 3¼ inch rope, were hung from the top of the main shears, down to the dome which rested on the platform below, and secured thereto. Both ends of the rope, which composed these tackle falls, were carried from the shears top, to the back of the building, where the men


a.a. Chains made fast to rocks below
b Running tackle made fast to rocks below
c.c.c. Tackle for hauling dome over lightroom
d.d.d Tackle for hoisting dome
e.e. Guys for steadying shears
c
c
d
d
d
e
e
b

were to be placed; separate parties of whom were to haul each end, at the same time. Guys were also attached to either side of the main shears, extending to the back ones, for the purpose of steadying them, and preventing their being twisted on being hauled in to the upright position. All was now ready for hoisting the dome, which was 12 in feet diameter and weighed 15 cwt. The operation employed about 30 men at the different sets of tackle and guys, and required half an hour from the time of commencing to hoist, to putting the dome down on its place on the lantern top. This was accomplished on the 7th of September.

Smeaton's remarks may not be uninteresting in regard to the same operation at the Eddystone Light-house. He says in his account of the building of that edifice:—"This morning was also " exceedingly fine, and the "Western" being in sight which was " appointed to bring out the cupola, we began to set up our shears " and tackle for hoisting it. This perhaps may be accounted one " of the most difficult and hazardous operations of the whole " undertaking, not so much on account of its weight, being only " about 11 cwt, as on account of the great height to which it was " to be hoisted, clear of the building; and so as if possible, to avoid " such blows as might bruise it. It was also required to be hoisted " a considerable height above the balcony floor, which though the " largest base we had for the shears to stand upon, was yet but 14 " feet within the rails, and therefore narrow, in proportion to their " height. The manner in which this was managed will in a great " measure appear by the representation thereof in plate No. 14 " (see the uppermost stage); but is more minutely explained in " the technical detail of that plate. As the legs of the shears that " had been used upon the rock, would have been in the way of the " cupola, they were now removed, as being done with there and " were used as a part of this machinery. About noon the whole " of our tackle was in readiness; and in the afternoon the "Western" " was brought into the gut; and in less than half an hour her " troublesome cargo was placed upon the top of the lantern without " the least damage. During the whole of this operation, it pleased " God that not a breath of wind discomposed the surface of the " water, and there was the least swell about the rocks I had observed during the season. This work did indeed require good " weather, and we had it, or otherwise we must have postponed it, " till it had at least seemed promising, but yet we were prepared for " something otherwise than perfect tranquillity, for besides that our " shears and tackle were so well lashed down and stayed, that " it was not a small blast of wind that would have carried them " away, I had it in contemplation (if it had been needed,) to have " appointed a couple of men to go up upon the cupola with staves " in their hands who could, in moderate weather, have defended " it from the wall. This evening the cupola was so far got fixed " with its screws, that the tackle was cast off from it, but this was " scarcely got done before the wind began to blow fresh at east."

I had ordered two Malays to climb up the scaffolding, which was not yet taken away from the building, as the dome rose and to push it off, so as to prevent injury to it; standing on the top of the lantern, where I could be seen by the various working parties for the purpose of directing the whole, but where the dome was hidden from view, I could not see what these two men were about; it appeared that one of the fellows for his own convenience and to save climbing, placed himself on the dome armed with a long pole to keep it off and in this manner he at length arrived at the top, where he seemed quite unconcerned in his aerial seat, and unconscious of occupying a position more prominent than would be agreeable to most people. Had I known his intention at first, I would have prevented him, as by his weight he increased the substance to be raised by at least another cwt. and more, but it was consoling to think that he had so much confidence in the stability of the apparatus and rigging, for in case of a failure in any one part, he would have been dashed to pieces on the rocks below. The safe placing of the dome in its seat was a subject of no small congratulation, for it was the last of a long list of difficulties and troubles that had engaged the services of the men during two seasons successfully overcome.

On the 8th the "Hooghly" arrived at 7 A. M. with orders for her engineers to help us in setting up the lantern and machinery; with their assistance all was ready, the machine set a-going, and the lamps ready for lighting, by the 21st September. On the 8th of the same month a wreck was descried lying off the north east point of Bintang, distant from the Light-house 12 miles. This proved to be the "Metropolis" a barque loaded with tea; she had struck on a rock and become water-logged, and was now floating about after being abandoned by the crew. The "Hooghly" with considerable difficulty towed her into Singapore, on being relieved from Light-house duty.

Having got the dome, machinery and light apparatus all ready, nothing remained for us to do but complete the arrangements for permanently lighting the building, which were the housing of provisions, water, oil &c., also procuring Light-keepers and rendering them competent for their duties. The Light was advertized to be shown permanently from the 15th of October, so that in the interval the men who were to compose the establishment were exercised in their several duties. On the 27th September, the Honorable Colonel Butterworth C. B., Governor of the Straits Settlements, with a party consisting of Sir William Jeffcott, Recorder of the Straits Settlements, Colonel Messitter, commanding the troops, Captain Barker, H. M. S. "Amazon," Mr Purvis, and the principal merchants of Singapore, together with several military officers, arrived off the rock at 1 P. M. when they landed and minutely inspected the Pharos.

His Honor the Governor and party embarked again at 4 P.M., after expressing themselves in highly favorable terms regarding all the works and the arrangements connected therewith. The "Hooghly" started at 7 P. M. and the Light-house was illuminated temporarily for the occasion until 10 o'clock P. M. by which time the Steamer was out of sight. As I accompanied his Honor's party, I had an opportunity for the first time of watching the appearance of the light, first when close to, and then gradually at a greater distance as we receded from it, until it was lost sight of under the horizon at a distance of 15 nautical or 17 English miles. The effect was brilliant at ½ a mile's distance, here the 3 reflectors of each group were distinctly visible and appeared separate, but when we attained the distance of two miles they merged into one. The light was never invisible to the naked eye at any time until we were beyond 9 miles from it; beyond seven miles vessels are either well out to sea or into the Straits, thus in the narrow passages in the vicinity, bearings can be had at any moment. The flashes continued bright for 15 seconds, when near the Light-house, and gradually lessened in duration as we gained a distance from it; when we had attained the distance of 15 miles, the light showed as a star of the first magnitude for a period of five seconds, once every minute, that is, there were five seconds of light and 55 of darkness in each minute. Though on the first night of lighting, many circumstances combined to prevent the light being shown to the best advantage, owing to the short notice we had of the intended trial, the principal of these being the inexperience of the keepers, badness of oil hastily procured and smoking of the lamps, which tended very much to decrease the effect, yet the party expressed themselves highly gratified at the result.

To Alan Stevenson Esquire, Engineer to the Northern Lighthouse Board, is solely due all credit in the construction and designing of the light apparatus, for to him this important part of the works was referred and intrusted.

At the date of writing this (15th December 1851) the light house has been illuminuted for two months, and consequently there has been ample time and opportunity to study its characteristics both in regard to its adaptation for the purposes of navigation, and its economy in management and maintenance. As to the appearance of the light commanders of vessels have invariably spoken of it in the highest terms. The flash though short has great and penetrating brilliancy, duration having been considered of less importance than magnitude, which promotes its early and quick discernment by the distant observer, especially when running for it in hazy weather from seaward.

The management of the light, after overcoming the little difficulties that are always attendant on works of such a nature to persons having no prior experience, has been found to be simple with due care, and the small number of burners (nine in all) have not only the advantage of giving out little heat in an oppressive climate, (a desideratum, where they are necessarily kept lighted in a small close room in which a keeper must always be present,) but the obvious one also of economy in the consumption of oil, and annual cost of upholding.

In the obtaining of these favorable results, much must be ascribed to Mr Stevenson's having introduced the holophotal system of lights by which all the rays emanating from the burners are intercepted by the apparatus, and by reflection or refraction bent in the direction of the horizon. The turning to useful account of all or nearly all the rays of the lamps, had already been long accomplished by M. Fresnel in his dioptric apparatus, with large burners illuminating the whole compass of the horizon, first introduced into the Light-houses on the Coast of France, but the idea of saving the rays that escape uselessly from small lamps, illuminating only a small arc of the horizon, seems first to have been practically carried into effect by Mr Thomas Stevenson, who, in a paper laid before the Royal Scottish Society of Arts, for which he was awarded the Keith gold medal, has published several elegant designs of lights of maximum intensity, in which all rays from the flame are rendered of useful effect, both by the methods of glass lenses and silver reflectors, disposed in different manners, and in combinations of the two systems.

The apparatus employed at the Horsburgh Light-house consists of the common parabolic mirror of the largest size with a portion cut off behind the parameter, *a a*, (Fig 2) for which is substituted a portion of a spherical mirror *b b*. To the front of the lamp is placed a lens *L* with three diacatoptric lenticular rings *pppp*. In the common parabolic reflector (Fig 1) the rays that escape the reflector *aaa* diverge in all directions and are lost to the observer, and to save which is the object of the new apparatus introduced. How this is accomplished will be easily understood by reference to Fig 2.

Fig 1.

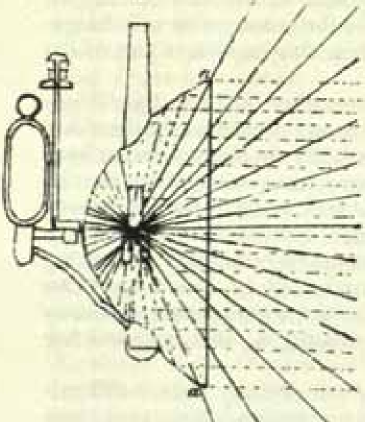
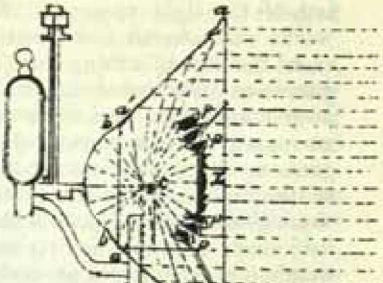


Fig 2.



From the flame *c*, which is in the centre of the sphere and focus of the paraboloid, the rays naturally diverge in every direction; those that fall on the spherical mirror *b b* are reflected back through the centre, and fall on the lens *L* and lenticular rings *p p p p*, by which they are bent in the direction of the horizon. The rays that fall on the parabolic mirror *a a a a* are at once reflected in the same direction, and those that proceed to the lens *L* and lenticular rings *pppp*, are refracted or bent also to the horizon,—thus no rays escape but all are carried forward to the observer. I have seen it nowhere stated what is the actual increase of power to the light by these alterations and additions, but it must be considerable, as nearly $\frac{3}{5}$ths of the whole rays escape uselessly from common parabolic mirrors.

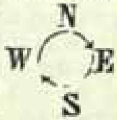
Nine is the number of holophotal reflectors that have been adapted to the Horsburgh Light-house; their diameter at the lips is 25 inches, and they are placed on a wrought iron frame, whose form is that of a hollow triangular prism, having 3 reflectors disposed on each perpendicular plane. The frame with its reflectors is supported by a wrought iron spindle, set in the centre of the light-room, and on which it makes the revolution of the whole circumference of the horizon once in three minutes; thus the planes that bear each group of reflectors are at minute of time distances, and each group shows its light to the observer stationed at any one point in the distance, once during that period, as already mentioned. The reflectors are composed of copper, plated with silver on the concave side. The burners are on the argand principle, and each has a fountain attached which contains sufficient oil for supplying the wicks during one night's burning.

The machine that causes the lights to revolve, is on the principle of a clock. The wheel work is contained in a cast iron case glazed all round with plate glass, through which all the motions of the working parts may be observed. The wheels are of gun metal, the larger of which turn on friction rollers. A weight gives motion to the machinery, by means of a rope attached to it proceeding from the drum of the machine over which the rope is wound. The weight is 9 inches in diameter, weighing about 100 lbs; slip weights can be applied to it to make it heavier. The weight travels in a groove cut into the wall, to this groove the rope is led by pulleys. The groove allows of a total rise and fall of 30 feet to the weight, which keeps the machine in motion for $2\frac{1}{4}$ hours, but the keepers wind up at the end of every hour. To tell the time a good clock is placed in the light-room.

The lantern that covers the light-room, consists of a dome and window framing, the former of copper and the latter of cast iron. The outer sheets of copper on the dome are $\frac{1}{8}$ of an inch in thickness, and the inner $\frac{1}{16}$ of an inch; these are secured to ribs and circles of copper by screws and rivets; a ventilator for assisting the escape of the smoke and heated air of the light-room crowns the top of the dome. The cast iron window framing is of a peculiar description lately introduced into Light-houses by Mr Alan Stevenson. This consists in their having no upright astragals, by which a great part of the light in other frames was intercepted in the azimuth which they subtended, but in their stead a diagonal arrangement has been substituted. This direction of the astragals not only has the effect of equalizing the light, but a greater stiffness and strength is given to the frame work, rendering it safe to use more slender bars and thus absolutely less light is intercepted. The panes of glass being at the same time triangular are stronger than rectangular ones of equal surface. This form of lantern is extremely light and elegant. The dome was painted white so as to show well as a beacon during the day.

Up to the 7th of October we were employed in making arrangements for the permanent showing of the light, and in completing the various little jobs that were still unfinished, preparatory to the workmen leaving. Signs of the approaching N. E. monsoon now began to show themselves. The busy traffic of the prows and lanchangs of the eastern coast of the Malayan Peninsula, that was always to be seen in the vicinity of Point Romania, had now gradually slackened. The numerous little mat sails could no longer be seen, such loiterers as were yet on their voyage, were now making their way towards the North, in order to enter their respective ports and rivers before the bars should be closed for the season by the surf and breakers. On the 8th of the same month five small fishing boats visited the rock from Subong, a village on the Bintang shore, they only contained one man each, and were managed by a double bladed paddle. It was a matter of surprise to us that they had dared to venture so far out to sea in such pigmy barks. They drew their boats on the rock at evening, and slept there during the night. The next day two other boats of the same description tried to make for the rock, but were blown back by a squall. The others departed the same day. They were of the Orang Laut tribe and rude, ill featured and forbidding in aspect, as these people generally are. A considerable swell had been coming in from the North-east for several days. On the 11th the "Charlotte's" gig reported having been chased by pirates off Pangerang, and being unarmed escaped by pulling. On the evening of the 13th the surface of the sea was remarked to be very phosphorescent and numbers of small insects were seen swimming about and occasionally approaching the surface, where they discharged a luminous liquid. On the night of the 15th the light was shown as had been advertised. The light attracted numerous insects to the glass windows, many of which seem to have come from the shore; butterflies, moths and dragon flies were seen amongst the number. On the 20th the swell from the North-east became very heavy, notwithstanding the surface of the sea was as smooth as glass. The swell was accounted for by the reports of vessels coming in from the China sea, where very heavy weather had prevailed. On the 21st the blacksmith could only work with great difficulty owing to the spray dashing into the smithy. On the 22nd the last of the Chinese were sent away from the rock with great difficulty. The sea was now making breaches over the rock on which our house stood and occasionally dashing the spray over the roof. Up to the 26th the sea moderated a little. I had left Singapore on the 30th of October and arrived again off the rock at 3 A. M. on the 1st November. Both the gun-boats were in company, filled with Light-house stores calculated to last till the end of March. Although when under sail we did not feel the swell, as morning broke we found a heavy surf on the rock caused by it. I went in the gig and pulled all round the rock, but found landing to be impossible; we lay at anchor till 8 A. M. and seeing no appearance of the swell going down weighed and ran for Point Romania. On the morning of the 2nd November finding that the swell had gone down I got both gun-boats under weigh and proceeded out to the rock, where we arrived at 8 A.M. and I landed at the south pier with some difficulty. We also managed to land the oil and provisions safely during the course the day. The Light-keeper reported that the swell was very heavy on the 27th of October, and during the night of that day that the north pier was washed away, the Chinamen's house knocked down, smithy washed away, and also the north part of my house. He did not notice how high the spray flew, but I saw on the 1st of November that at times it went as high as the third story, and the sea was not so heavy then as it had been on the 27th, nor by any means so high as it is at times during the months of December, January and February, when the monsoon blows strong and regularly. In landing the provisions one man was severely crushed between the boat and the pier. Up to the 4th of November the sea still continued running in at times heavily, sending the spray over my house so as to shake it rather uncomfortably. Notwithstanding the swell was from the N. E. the wind continued veering from west to south east, but the fact of vessels making the passage from China to Singapore at this time in seven days, shows that it must have been blowing strongly down the China Sea. The pier to the south of the rock it was observed scarcely felt the pressure of the passing breakers, the only indication being a slight vibration of the iron chains. The breakers I judged to be at times 8 to 10 feet high. I remained at the Light-House till the expected arrival of the "Hooghly," and in the interval was employed in making a survey of the rock and its vicinity. Until now I never had leisure to commence this desirable work, and had great difficulty at this late period in getting it accomplished, owing to the impracticability of landing on the adjacent rocks to get observations, and to the stations being washed off them after being erected, but I at length succeeded in obtaining all that was necessary. On the 17th of November the Steamer "Hooghly" arrived, and, with the aid of her Engineers, having taken down, cleaned, and oiled the machine, and executed other little works required before leaving the place for the season, we departed for Singapore on the evening of the 18th at 7 P. M.

It may not be out of place here to notice the various atmospherical disturbances that had arrested our attention during the past season. The curious phenomenon, popularly known as the water spout, was frequenly seen in the Straits, and on two occasions I was fortunate enough to observe them in full action at a distance of little less than a half a mile. On the first occasion, when on board the gun-boat "Charlotte," off Barbukit Point at 4 P. M., on the 29th of May, a heavy cloud with rain about to fall from it, was observed to be approaching, driven by the south-west breeze then blowing. To the southward the atmosphere was observed to be damp and hazy, while to the north it was clear and dry. On the rain reaching the sea a vapour tube was seen to protrude in the midst from the cloud downwards, gradually lessening in its diameter till it reached two thirds of the distance between the cloud and the sea, and below which point the tube did not descend. The altitude of the cloud was judged to be about 1,000 feet above the surface. A small attenuated column of white vapour was now noticed to rise out of the sea with a hissing noise, and which was soon surrounded by white vapour disengaged therefrom. This column quickly effected a junction with the large and heavy vapour tube depending from above, into the centre of which it seemed to be received. The water spout played for about 5 minutes, during which time the depending tube appeared alternately shortened and elongated and the vapour surrounding it maintained a spiral motion. The day was hot.

Again on the 1st of July another was seen from Pedra Branca, bearing south-west, and approaching the rock. This was at 4h. 15m. P. M. The height of the spout seemed to be nearly 1,000 feet, and its diameter half way up 50. The depending tube revolved thus 

In this one which was of very large diameter, two columns or tubes of vapour seemed to be in action, one within the other. The depending one whose massive and opaque vapour was derived from the cloud, enveloped the other, which was thin and attenuated and rose from the sea, with the noise above described and entered the lower end of the depending tube, through which it seemed to ascend up to the cloud. The ascending column as usual disengaged much white vapour from the surface of the sea, and with which its lower end was surrounded. This water spout depended from a nimbus and rain was falling all round it. The nimbus was travelling north-east, and the water spout was on the advanced edge of it. At 4h. 25m. the depending tube gradually wasted away, until it vanished, when the white vapour of the ascending column parted from the surface of the sea and ascended like the curling of smoke up towards the cloud, at the same time the hissing noise ceased and the surrounding minute spray entirely disappeared.* The atmosphere was clear and dry to the north-east, but rainy and threatening to the south west from whence the nimbus travelled.

Probably twenty others were seen during the season, but at too great distances for satisfactory observations; one of these was seen at 2 miles distance and watched from the commencement to the conclusion; this was on the 29th of May, a little after the first above described was observed, being at 4h. 55m. P. M. and of which the following notes were taken:—At 4h 55m the spout just commenced to protrude from the clouds; at 5h 00m it projected downwards, and at 5h 01m took the form of a needle, depending one-third of the way to the sea, in a diagonal direction. The cloud was a nimbus with towering cumuli rising above it, and rain fell all round the spout, so that by 5h 03m it was partially obscured; by 5h 04m the spout had reached ⅔rds down to the sea; at 5h 05m the spout become indistinct owing to the rain closing round it, and at 5h 06m it disappeared altogether. In this one no vapour was seen to rise out of the sea nor any ascending attenuated column. The spout apparently had not fully formed. By 5h 40m a heavy shower had fallen, which now began to clear up. As this report is only for the purpose of presenting to Government an account of the more notable occurrences that took place during our operations, it would be out of place to prolong it, by speculations of my own on a topic, however interesting, not particularly connected with the works, but I may be permitted shortly to state, that the phenomenon of water spouts has been referred by the philosophers of Europe to the agency of electricity, they being, as is asserted, the prolongation of protuberances of electrified clouds towards the sea, occasioning thereby a mutual attraction between the water and clouds. That this is the correct theory of their formation, all the facts that I have observed, seem to confirm; the large depending and dense tube of vapour being drawn from the cloud by attraction towards the sea, and the small ascending and attenuated column, which rises inside of the large depending tube, being drawn from the sea, disengaging at the same time minute particles of water therefrom, which rise around its base in the shape of mist or minute spray. It was invariably remarked that water spouts formed themselves in rain clouds or nimbi at a time that the rain was about to fall or had fallen for a short time; the state of the atmosphere favorable to their formation would therefore appear to be just when the capability of the air to support the cloud was in a balanced state.[*]

---

* In this one I observed what was something new to me-viz. that the particles of vapour contained in the outer and dependent tube besides being driven in the helical curve round the inner or ascending column revolved also round the threads of the helix.

The larger atmospherical disturbances of squalls formed also interesting objects of observation, the frequency of their occurrence in the Straits of Malacca, and the force with which they sometimes press on the sail, render them of too much consequnce to the frequenter of these seas to be lightly considered. The squalls may be divided into local and general, the first forming in the isolated hills and influencing the immediate districts only, and the latter, termed "Sumatras" as they invariably come from that island, affecting hundreds of miles on the same day.

---

[*] In Colonel Reid's work on the law of storms, page 9. Horsburgh's description of water spouts is given as extracted from the India Directory viz. "When a whirlwind or waterspout is observed forming at a small distance a cone may be perceived to descend from a dense cloud in the form of a trumpet with the small end down-wards; at the same time the surface of the sea under it ascends a little way in the form of steam or white vapour from the centre of which a small cone proceeding upwards unites with that which projected from the cloud and then the water-spout is completely formed. Frequently however the acting cause is not adequate for this purpose; and in that case after the water-spout is partly formed, it soon proceeds to disperse.

"There is in the middle of the cone which forms a waterspout a white transparent tube or column, which gives it a very dangerous appearance when viewed at a distance, as it seems like a stream of water ascending; but when closely approached the dangerous appearance partly vanishes. I have passed close to several waterspouts and through the vortex of some of them forming and was enabled to make the following observations.

"By the electric force or ascending whirlwind a circular motion is given to a small space of the surface of the sea in which the water breaks and runs round in a whirlpool with a velocity of two, three to four or five knots; at the same time a considerable portion of the water of the whirlpool is separated from the surface in minute particles, resembling smoke or vapour, with a hissing noise occasioned by the strength of the whirlwind. These particles continue to ascend with a spiral motion up to the impending cloud. *In the centre of the whirlwind or waterspout there is a vacuum*[*] in which none of the small particles of water ascend; and in this as well as around the outer edges of the water-spout large drops of rain descend; because in those places the power of the whirlwind not being able to support the ascending minute particles they constantly descend in the form of rain. The vacant space in the centre of the waterspout seems to be that which has a white transparent appearance like a column of water when viewed at a distance or resembling a hollow glass tube. In calm weather waterspouts generally have a perpendicular direction; but occasionally they have an oblique or curved direction according to the progessive motion given them by the prevailing winds. Some times they disappear suddenly; at other times they move rapidly along the surface of the sea and continue a quarter of an hour or more before they disappear.

"Waterspouts are seldom seen in the night, yet I once passed near a large one in a cloudy dark night. The danger from waterspouts is not so great as many persons are liable to apprehend; for it has been said that a large body of water descends when they break, enough to sink the ship. This does not appear to be the case as the water descends in a heavy rain where it is broken from the ascending whirlwind. But there is danger to small vessels of being overset when they have much sail out; and large ships if they have not their topsails clued up and yards secured may be liable to have them carried up to the mast heads by the force of the whirlwind and thereby they may lose their masts. In the vicinity of the waterspout the wind is subject to fly round in sudden gusts rendering it prudent for ships to take in their square sails.

[*] Colonel Reid notes to this "probably a calm, if it were a vacuum the water would rise and fill it." To me it appears to be the continuation of the attenuated and ascending current, proceeding from the sea up to the cloud, which is greatly less dense than the depending and enclosing tube of rain or vapour drawn from the cloud.—J. T. T.

The local squalls were observed to form on the only high hills within view from Pedra Branca viz, Bintang and Barbukit. During the calm months of May and June, should the day be more than usually hot, by noon the moisture of the atmosphere was invariably seen to condense on the cool tops of these eminences, and form into high accumulated masses of vapour, by one or two o'clock the atmosphere being refrigerated and rendered dense in the process would rush down from the summits, displacing the hot and rarified air of the plains, and cooling with its accompanying showers the parched soil. At the change of the monsoons before either had set in to blow regularly, the local squalls would be seen to spread themselves out from the locality of their

---

"When a whirlwind happens on land all the light substances are carried up in "a spiral motion by it. I have observed one pass over Canton river in which "water ascended like a waterspout at sea, and some of the ships that were moored "near its path were suddenly turned round by its influence. After passing over "the river it was observed to strip many trees of their leaves, which together "with the light covering of some of the houses and sheds it carried up a considerable way into the atmosphere."

From the evidence collected by Colonel Reid regarding this phenomenon, it appears that he could only obtain one account in which the gyrations of the wind are satisfactorily explained, and in this instance it proved to be at the surface of the sea turning in a coutrary direction to the apparent law in great storms.

Colonel Reid suggests "that thin semi-transparent columns which stalk as "it were on the surface of the ocean in calm weather though no cloud is to "be seen above them, as well as the small agitated circles which are only seen "by their marking the smooth surface of the sea in their gyrations may probably "have the same origin as the waterspout. One of these circles which appeared "too insignificant to do harm after performing many gyrations near a ship commanded by Captain Marquis on the coast of Malabar, suddenly approached her "as she lay becalmed, with her sails loose, and passing across her bows carried "off the flying jib and jib-boom into the air higher than the mast head." Colonel Reid adds "I have myself witnessed these semi-transparent columns within the "tropics without being able to decide which way they turned round."

I have never witnessed these semi-transparent columns in these parts, but that faithful observer Dampier mentions having seen one on the coast of New Guinea in the account of his voyages, vol. iii p: 223. He thus describes it:

"About a quarter of an hour after the sun was up there was a squall to the "windward of us; when on a sudden one of our men on the forecastle called out "that he saw something astern but could not tell what: I looked out for it and "immediately saw a spout beginning to work within a quarter of a mile from us "exactly in the wind. We presently put right before it. It come very swiftly "whirling the water up in a pillar about 6 or 7 yards high. As yet I could not see "any pendulous cloud from whence it might come; and was in hopes it would "soon lose its force. In 4 or 5 minutes' time it came within a cable's length of "us and passed away to leeward; and then I saw a long pale stream coming "down to the whirling water. This stream was about the bigness of a rainbow; "the upper end seemed vastly high not descending from any dark cloud, and "therefore the more strange to me, I never having seen the like before. It "passed about a mile to leeward of us and then broke. This was but a small "spout not strong nor lasting; yet I perceived much wind in it as it past us."

In the tropics it would thus appear that rain clouds are not necessary to the formation of water-spouts, for at high temperatures the air many contain $\frac{1}{23}$rd of its weight of invisible steam or moisture so a stratum of air charged with moisture in an electrical state on being driven over a dry under-stratum would favor the formation of the phenomenon. See Journal India Archipelago, vol. 5. p. 150.—J. T. T.

formation equally in all directions, upon the surrounding plains. But when either monsoon was blowing they would be carried in the direction of the prevailing wind,—during the S. W. monsoon, towards the North and N. E., and during the N. E. monsoon towards the S. and S. W. Even during the height of the N. E. monsoon, which blows more steadily than the S. W. one, at night its under current of air would always moderate, if not cease, though as might be seen by the travelling clouds above, the upper current was not arrested in its progress. At the latter end of this monsoon, it has not power to overcome the density of the air overspreading the Peninsula, created during the cool of the night, until 10 or 12 and even 4 o'clock of the following day. On such occasions if the weather be fair and hot, the atmosphere will have condensed its vapour on Barbukit hill, and from whence heavy squalls will proceed across the Straits of Singapore assisted by the monsoon. Of this we had many instances, heavy N. E. squalls having taken the gun-boats inside of the Straits, while at the same moment 10 miles distant an agreeable and permanent N. E. breeze has been experienced out at Pedra Branca.

The laws that have been observed to generate and direct the local squalls may be safely assumed to operate in the same manner, with regard to the general squalls or "Sumatras," that in the Straits come from the direction of that island during the South-west monsoon. In Sumatra the regular prevailing wind may be supposed to meet obstruction in the high range of mountains, that intersect the island in a longitudinal direction, and not having strength enough at all times to overcome the barrier, is curbed, until as has been seen to be the case with the local squalls, condensed air has been formed on the highlands, which with its accompanying vapours, rushes down to displace the heated and rarified atmosphere of the vallies and plains on the lee, and being at the same time urged on by the pent up force of the monsoon now let loose, stretches itself far and wide over the Malacca Straits, and the generally low lying surface of the Malayan Peninsula.

These "Sumatras" were found to arrive at Pedra Branca between the hours of 3 and 8 A. M., and if we be allowed to infer with regard to their time of origin, that it is the same as obtains in local squalls, viz. from 11 A. M. to 4 P. M. assuming the distance travelled to be nearly 300 miles, their rate of progression will be 19 to 20 miles an hour. This was corroborated by watching their arrival at distant high points of land seen from the rock, and noting the interval of time consumed in their coming to the rock. A storm or gale is generally estimated to travel at the rate of 32 miles an hour; but it is only for the first few minutes that a "Sumatra" assumes this character, and this only in sudden puffs; they soon decrease in force to a high wind, which is said to travel at the rate of 16 or 17 miles an hour. The approach of a "Sumatra" has much to attract the attention of the student of nature. The most imposing characteristic is in the immense arch that it forms, stretching from the zenith to opposite points of the horizon, and below the arch, which is of the darkest hue, there are suspended dark grey vapours, about to descend on the surface of the earth. Above the dark arch, will be seen light grey fog banks, over which a slighter arch will be spanning, and which is again crowned by white fleece clouds, contrasting, if the squall approach at day-light, strongly with the blue sky above and the dark masses below.*

PART V.

Original and sanctioned estimate for the Light-house.—Total cost exclusive of charge for Gun-boats and Steamer.—Difficulty of estimating a work of this nature.—Actual cost not more expensive than had the work been done by contract.—Advantage of having the work put together by labourers on daily wages.—Establishment for maintaining light.—Cost of same. Accommodations of Light-house.—Testimony with regard to Mr Bennett's services.—Effective and hearty services of the gun-boats and lighter.—Utility of the steamer at the commencement of operations and her after services.—Liberality of the authorities of the Dutch settlement of Rhio.—Inscription on Tablet.

It now remains for me to lay before the Government the particulars regarding the estimate and cost of the Light-house works, the cost of the permanent establishment engaged to maintain the light, and arrangements connected therewith.

The detailed estimate for the materials and workmanship of the building, will be found annexed (see Appendix III) it will therefore be only necessary here to particularize the principal items as follows:—

Experiments and models sanctioned by a letter from the Governor of the Straits settlements No 97 of 1848......	$100.00
Estimate of materials and workmanship, dated 14th of May 1848 accompanying my letter dated 20th May 1848......	13,101.78
Estimate of table allowance on board "Hooghly" as per my letter to Resident Councillor dated 20th May 1848....	227.00
Estimate of cost of Supervision viz, Superintendent's deputation allowance $1,636.36. Foreman's salary $1,090.90 as per my letter to Resident Councillor, dated 20th May 1848......	2,727.26
Estimate of lantern, apparatus, and lightning conductor £1,500 at 4s 6d per dollar....	6,666.66
Total original estimate....	22,822.70

---

* Horsburgh has the following remarks regarding Sumatras (see Directory):—"Sumatras or squalls from the South-westward are often experienced in the "South-west monsoon; also North-westers or squalls from this direction are "then more common than in the other season. Sumatras generally come off the

To which add extra works and salaries since sanctioned as follows:

Salary for an extra Foreman at Pulo Ubin sanctioned in a letter from the Resident Councillor, No 659 of 1850....	121.00	
Additional works sanctioned as per annexed detailed statement (see Appendix III) in a letter from the Resident Councillor No 884 of 1850....	906.40	
Furniture &c ditto ditto....	499.40	
Addition to Mr Bennett's pay sanctioned in a letter from the Resident Councillor, No 753 of 1850......	277.00	
		1,803.80
Total expenditure sanctioned....		$24,626.50

The total cost of works, exclusive of the charge of maintaining two gun-boats and occasional services of a Steamer, which was borne by the Government, will be seen by perusing the annexed abstract of expenditure (see Appendix IV) to amount to the sum of 23,665 Spanish dollars 87 cents, which exceeds the original anticipated outlay by 843 Spanish dollars 17 cents, but is less than the total expenditure sanctioned by the sum of 960 Spanish dollars 63 cents. From the expenditure should be deducted the small sum of 52 dollars 29 cents, which was received for various small articles sold during the progress of works and at their completion when no longer required, and this statement would have showed a still more favorable result, were it taken into account that the lighter, which cost the Light-house nearly 700 Spanish dollars, was at the end of our operations given over to the Convict Department at a nominal value; a ship's gig, blacksmith's tools, and other implements were also in the same manner given over to the Master Attendant's Department. The value of the above articles of course were much depreciated by use, so nothing but a nominal value could be placed upon them. The unavoidable absence of the Steamer during our second year's operations, which were entirely carried on without her, caused also some additional outlay.

"land during the first part of the night and are sometimes sudden and severe "accompanied with loud thunder, lightning and rain; they are experienced "throughout the Strait particularly in the vicinity of the Pedier Coast and "between Parcelar Hill and the Carimons. Here they often blow for 6 or 8 "hours at a time either in a strong or moderate gale, the commencement being "mostly sudden and severe; for in Malacca Road where they generally begin "between 7 and 8 P. M., and at midnight many ships part their cables, and some "have been driven by these squalls on the mud bank that lines the shore." It will be noticed by the reader that the Malacca Strait being nearer to Sumatra by 70 to 100 miles than Pedra Branca, will account for the Sumatra squalls arriving at the former place at an earlier period of the night than they are experienced at the latter.—J. T. T.

It will not perhaps be improper for me to mention here, that the estimates and plans for the Light-house were sanctioned by the Hon'ble the Court of Directors, as per their despatch No 3 of September 1849, under the expectation that the work would cost double the sum submitted to them, as being sufficient; nor if it had cost double do I think much blame could be attached to me, for in my letter No 19 of 1849, which I presume was laid before the Hon'ble Court, and which probably guided their opinion on the subject, I wrote as follows:

"For the reasons noted in my letter to his Honor the Governor, " dated 20th November 1844, regarding the erection of a Light-" house on Peak Rock, the estimate has been constructed with " the anticipation, that the building of it will be given to a " Chinese contractor, as that class are the only people that could " undertake such a work under any limited sum. I have conse-" quently given in the estimate the actual cost of materials as " placed on the rock, and allowed 10 per cent profit to the Chi-" nese who may undertake to finish the building. This I trust " will meet the approval of Government as being the cheapest " and most expeditious mode of completing this desirable work, " for on the system of daily labour, I could not promise its being " done at double the amount now submitted.

"In undertaking a work of this kind there is more than ordinary " risk to the contractor;—first, owing to its solitariness, there will " be difficulty in procuring labourers,—second, the exposed position " and difficulty in landing, subject those engaged to many acci-" dents,—further, the limited number of labourers of the class " required may raise the demand to considerably above their " present wages, at the time the Government may sanction its " commencement, but as I have taken those difficulties into " account in the estimate, I have every reason to think under all " ordinary circumstances, that the actual cost will not exceed the " sum stated, but at the same time I must add, that the cost of a " work of this kind cannot be calculated with the same precision " as an ordinary building in Singapore town."

As already hinted in Part II, now that the works have been completed by Chinese working as daily labourers and not by contract at a cost below the sum sanctioned, I much question if the work would have been at all benefited by the contractor's remaining; had he held to his engagement, the Light-house would not have cost the Government any less than it has done, even though no claim is made good against his security for the over expenditure as stated below, and probably considerably more, for he would have charged as high as possible for additions, extra works and so forth, so that the amount eventually paid to him would have much exceeded the original contract.

			Sp.drs. Cts.
Amount of contract entered into by Choa Ah Lam for brick, granite, wood and iron work, labour, transport of materials, &c, as detailed in specifications and contract, dated 2nd January 1850			10,600.00
Cost of building exclusive of lantern, apparatus and lightning conductor		17,779.36	
Less the following items not agreed for in contract.			
Brass	358.44		
Copper	424.33		
Cement	542.00		
Furniture	206.50		
Cost of Supervision	2,893.75		
Extra Works	906.40		
Part of tonkang and boats	200.00		
Part of sundry expences	600.00		
Part of wages of men employed on extra works	500.00	6,631.42	11,147.94
Extra outlay beyond the original sum for which the Chinese contractor agreed to complete his share of the Light-house works		Sp. Drs	547.94

It will be sufficient reason for the contractor's share of the works, amounting to $547.94 above the amount agreed to be paid him, when I again ask attention to the fact, that on my taking the work in hand, his men raised their demands for granite work from $6 to $8½ per cubic foot, bricks from $18 to $25 and other materials in the same ratio; workmen were also hired under equal disadvantages; the annual services of his men had been purchased from the junks at $12 per annum, he supplying their food, by which arrangement they only stood him at most $4 per mensem, while I was forced to give to the same men 10 to 13$ per mensem. It is therefore plain that had he gone on with the contract, he would have gained by it, probably as much as, or more than, was anticipated in the estimate, though owing to the above circumstances, the work has not been so cheaply accomplished by me. At the time prior to his disappearance, it will have been noted in Part III what trouble he and his men occasioned, and how difficult it was to procure from him the necessaries of life, even for his own people, not to speak of materials for the building and this would have been the case throughout. It is therefore rather fortunate than otherwise, that he left the country, for on the works being carried forward on Government account, there remained no one connected with them whose interests were against the necessary outlay, or consequently against their solid and unexceptionable construction.

By the engagement of the men on daily hire, though the mode may be more expensive than that of contracting, this advantage was gained, that it became their interest to do well and honestly, to the satisfaction of their employers, the portions intrusted to them, instead of slurring over and hastening their labours, as contractors are too apt to do, and which cannot be guarded against, even by the closest attention to each man's work, and this it is scarcely possible to give, where many are employed. The circumstances would probably be different, were there men of capital and character to be found to contract for works in these parts, as well as a sufficient number of them to create competition and keep down prices to what would be only fair remuneration, but in Singapore none such exist. I therefore believe it was the best course for the interests intrusted to my direction, whether the expence or trouble involved of either mode be considered, that I did not employ contractors again, but carried forward the works on my own responsibility, engaging the workmen, paying their wages, and buying all the materials myself, full and detailed accounts of which have been forwarded to the authorities.

When the Light-house was about being completed I addressed the Government regarding the requisite establishment, in a letter to the Resident Councillor, No. 15 of 1851. I also transmitted proposed rules for the guidance of the light-keepers, which will be found annexed, and all of which received approval. Regarding the establishment I wrote as follows:—" *Light-keepers.*—On the " subject of light-keepers and establishment for the Light-house, " I made some suggestions in my letters No. 20 of 1848 and " No. 28 of 1850; at the period of writing the former letter, " the estimates of the building had just been made, at which time " the rock had only been once or twice visited, my remarks " regarding the future maintenance of the light (at that time " uncertain of accomplishment) were necessarily short and immature, as the peculiarities of the position had not been studied, " there having been no opportunity to do so, they were therefore " subject to future correction. At the period of writing the " second, though I had the experience of one fair season spent " in building operations, yet the knowledge of the state of " the weather in the vicinity of Pedra Branca, and of the action " of the waves at and around the rock during the stormy season " of the N. E. monsoon, had not been observed. What remarks " I have now to submit to your consideration, I make under " greater advantages than I possessed at these former times, " having on several occasions put out to the rock during the last " North-east monsoon in order to ascertain the facts requisite to " be known with regard to communication with the Light-house " during that season, such as the possibility of changing the " light-keepers, furnishing stores, &c. What I now humbly sug-

" gest regarding the establishment necessary to the permanent " showing of the light, I trust will be worthy of your favorable " consideration.

" In my letter No. 28 of 1850, I suggested three methods of " keeping up an establishment for lighting the building; the " last method proposed in that letter, viz. of always maintaining " on the rock a party consisting of one European and eight " natives, seems now to me considering all circumstances, to be " the best with some slight modifications. I have found that " during every month of the N. E. monsoon that there will be " opportunities to land the keepers, though water and heavy " provisions may not always be possible to land; at the same " time access to the rock will not be closed for 4 or 5 months, " as formerly supposed. The difficulty of keeping all the establishment at the rock is therefore now not so great as formerly " supposed, and the stationing of part of their body at Point " Romania is consequently unnecessary. By having their whole " body at the Light-house, this advantage is further gained in " the sufficient protection of the building, and its contents against " the pirates, and other evil-disposed persons, which would not " be the case were only 3 or 4 men stationed there.

" The establishment that I would now propose will consist of " thirteen individuals, instead of fourteen, as proposed in my " letter No. 28 of 1850, and I believe it would answer all " purposes, if placed under efficient superintendence. It is as " follows:

" 2 Head light-keepers, Europeans.
" 2 Assistant do. Malays.
" 3 Tindals do. do.
" 6 Lascars, one of whom to cook
—
13 Total establishment.

" The light-keepers I would propose to change monthly, and " the tindals and lascars every two months, thus there would be " always at the Light-house:

" 1 Head light-keeper.
" 1 Assistant do.
" 2 Tindals.
" 4 Lascars.
—
8 Total at the Light-house.

" On shore on leave at Singapore there would be

" 1 Head light-keeper.
" 1 Assistant do.
" 1 Tindal do.
" 2 Lascars do.
—
5 Total on leave.

" For assistant light-keepers, tindals and lascars, I believe the " Malays to be best adapted. In case of difficulty in landing, " which is of frequent occurrence, they are more expert than " either Chinese or natives of India ; in the management of boats " they are in their element, while other natives are quite at a loss, " either from inexperience or sea-sickness ; to be good boatmen " is necessarily indispensible for light-keepers, in such a situation. " For head light-keepers, I fear Europeans will not be obtainable " under any moderate cost, but respectable Indo-Europeans will " suit as well.

" *Provisions.*—In making arrangements as to the pay of the " light-keepers, I would humbly propose that the provisions " necessary to life, excluding curry stuffs and spices, be furnished " by Government. The following I think would be a fair al- " lowance per man :

" Rice	45	catties	per mensem.
" Salt-fish	6	"	"
" Oil	1	"	"
" Salt	¼	"	"

" The Malays are too heedless characters to be intrusted with " furnishing themselves. It appears from Smeaton's account of " the Eddystone Light-house, that the keepers when they fur- " nished their own provisions, were frequently reduced to eat " the candles. On the 1st of November, 5 months' provisions, " wood and water should be stored on the rock, for, though the " light-keepers may be able to land, probably provisions will be " difficult to be got upon the rock during the North-east monsoon. " At all other times 2 months' provisions should be placed on " the rock in advance, so as to prevent the possibility of the men " being forced to leave it from starvation."

In accordance with the above suggestions, the following establishment was engaged and provisions and other necessaries laid in for 5 months :

Statement of the establishment for tending the Horsburgh Light-house, including the estimated amount of ordinary contingent charges.

Establishment.	~~Rs~~	~~Rs~~
1 Head light-keeper	90	
1 Second ditto...	80	
2 Serangs at 25 ~~Rs~~ each...........	50	
3 Tindals 16 " "	48	
6 Lascars 13 " "	78	
	346	
Rice, salt-fish, oil and salt to 8 men on duty at the Light-house............	20	
Total establishment and rations..		366

Contingencies.

Oil for lantern 3½ piculs............	55	
Cotton, wicks, cloth and rouge........	10	
Glass chimneys	17	
Paint and varnish for lantern, railing, awning for boat &c. &c.	20	
Expense of superintendent in visiting Light-house	20	122
Total monthly expenses Co's ~~Rs~~		488
Total annual ditto ditto..		5,856

Regarding the proposed rules I offered the following remarks in the above quoted letter:—" *Rules for light-keepers.*—The " accompanying rules for light-keepers (see Appendix V.) I " humbly submit for the consideration of Government. In drawing " them up I have been guided by those addressed to the " keepers of the Northern Light-houses of Great Britain, by the " Engineer to the Commissioners. I have only modified them " to suit the circumstances of this climate. Should they be approved " of, I would suggest that a copy both in English and " Malay, be hung in the light-room of the building."

Other subjects were also brought to the notice of Government in the same letter regarding journals, store books, visitor's book, arms and ammunition, meteorological observations, &c. which are of hardly sufficient interest to be introduced here; it will be sufficient to say that all these met with the same kind and considerate attention as all other concerns of the Light-house during the past two years had received from the authorities; and for which I, who was personally bound to the undertaking, and so intimately connected with its success or failure, cannot feel too grateful.

The Light-house contains the following accommodations:—On the top is the light-room covered by the lantern, in which the lights revolve, this room is 12 feet in diameter. Outside the light-room is a balcony guarded by a stone parapet, here a tindal is always stationed on the look out during day-light. Below the light-room is the visitor's room, which is appropriated to the use of persons that visit the rock, or to the superintendent in charge, when he may come to inspect the building. Next is the European light-keeper's room, below that again the native light-keeper's, called the serang. One serang and two tindals occupy this room together; next is the lascar's or sailor's room, of whom four occupy this one room; next comes the rice and provision store, below that again the oil and light-room store, and lastly comes the water store, contained in a vault entered from the oil store. The rooms are ascended to by ladders, and brick partitions and doors shut off the common passage containing the ladders from all the rooms, so that they are private. Outside the tower is the cook-house, constructed entirely of granite, and close to the cook-house is a vault partly cut out of the rock, and enclosed by granite walls, containing extra water and lumber; above the vault is a paved platform, over which is stretched an awning where the men take their victuals, and perform any out-door employment. A small garden, as has already been mentioned, was also constructed outside the tower, but the success in raising any vegetables excepting hardy sea shore plants, is very problematical, judging from what I noticed before leaving the rock, for the season. Two boats were left hoisted up to sheltered parts of the rock, in the smaller of which the men are allowed to go a fishing, after the duties of the day have been gone through. This no doubt will take away much of the sameness and loneliness of their duties.

In concluding this account of the Horsburgh Light-house, I have much satisfaction in bearing testimony to the great value that the services of Mr John Bennett, who acted as foreman from the commencement to the finishing, were to the operations, and to the workmanlike manner in which all was executed that was entrusted to his care. When I was frequently absent from the site of the Light-house, on other duties at Singapore, or Pulo Ubin, I found that his zealous and careful conduct of the works, and judicious and temperate treatment of the workmen, caused them to proceed as expeditiously as I could possibly wish.

I have had little opportunity to speak of the services of the gun-boats and lighter, which acted as tenders, and therefore must take this opportunity. On them devolved a very important part of the operations—viz. the carrying of wood and water, stones and materials for the works; the men, after the first crew of the "Nancy" were discharged, performed their duties with such heartiness and good-will, that I cannot speak too favorably of their exertions, they were of the greatest consequence to us, and they gave us the full benefit of their labour. Though the seas here during the S.W. monsoon are smooth at most of times, yet to vessels of their small burden, the vicinity of Pedra Branca, with its deep channels and strong tides is by no means agreeable or safe; during the heavy "Sumatras" they were forced constantly to encounter, the seas washed over their low decks fore and aft, also in making for the rock at night the danger of being wrecked on the outlying rocks was often eminent. As an instance, I may mention that one morning on the occasion of a heavy "Sumatra" having come on at dawn, the "Charlotte" was noticed to be under a press of sail, in order to weather the South Ledge, on which a strong tide was setting her, in unfurling the jib preparatory to hoisting it, a man was washed over board, and at this critical moment they had to bear up to save him, but to our consternation we observed her to miss stays, and drift directly down towards the danger she had been trying to escape; she however happily drifted past without touching, and picked up the man at the same time.

The "Charlotte" during the two seasons had no less than 5 masts sprung or carried away, and one bowsprit, which fact in itself will describe the nature of the service in which she was engaged. The gun-boats owing to their draft of water could not come alongside the pier to discharge, so were forced to send their lading by their jolly boats to the rock. These small boats did not measure more than 16 feet long and 4½ feet in beam, yet they performed the work without accident excepting in one instance, when one was capsized and sunk by a breaker; it is also worth mentioning that these little boats could come alongside, when the lighter could not approach owing to the swell. When calms prevailed the service of the tenders was most laborious, for then the crews had to pull all day, seated on a flush deck where little shade could be had from the great heat of the sun's rays. In this manner the gun-boats and lighter were kept constantly employed day and night, during the whole term of our operations. None of the gunners in command, for one reason or another, remained in the service during the whole period of operations, but I must not neglect to mention favorably the name of Mr Castor, now gunner in command of the "Charlotte;" he was in charge of one of the gun-boats, during the whole of the last season, and by his smartness and diligence was of great service. On the rock also, where any heavy rigging or tackle was to be set up, or large weights lifted, he and his crew were of much assistance.

For the presence of the H. C. Steamer "Hooghly" on all occasions when she could be spared from her other duties, I must make my best acknowledgements to the authorities; at the first commencement of the works we would have done very badly without her. The services of that vessel were of the greatest use in establishing us on the rock. During the first season she also towed out eighteen courses of the building, besides other materials.

The generous and highly gratifying liberality of the authorities of the Dutch settlement of Rhio, in having one of their gun-boats always in the proximity of the rock, during the whole term of the operations, tended much to assure the working party of safety, and their services were on many occasions very opportune, on sudden emergencies, when all our tenders were absent.

On the completion of the Pharos, the following tablet was ordered to be placed in a panel of the wall of the visitors room:

Pharos ego
Cui nomen præbuit
HORSBURGH HYDROGRAPHUS.
In maribus Indo Sinicis præter omnes præclarus
Angliæ Mercatorum nisa imprimis indole
Ex imperii opibus Anglo Indici denique constructa
Saluti nautarum insignis viri memoriæ
Consulo.

A. D. MDCCCLI.
W. J. Butterworth, C.B.
Prov. Malacc. Præf.

A. D. 1851.
THE HORSBURGH LIGHT-HOUSE
is raised by the enterprize of British Merchants,
and by the liberal aid of the East India Company,
to lessen the dangers of Navigation,
and likewise to hand down,
so long as it shall last,
in the scene of his useful labours,
The memory of the great Hydrographer,
whose name it bears.

Col. W. J. Butterworth, C. B.
Governor in the Straits of Malacca

J. T. Thomson
Architect.

APPENDIX I.

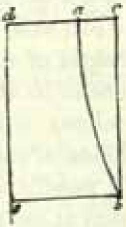
Tables of the Radii of a Column 56 feet high, 22 feet diameter at bottom and 16 feet at top at given heights according to various curves.

Height from top of Shaft.	Height from top of Rock.	*Parabola.*		*Hyperbola.*			*Ellipse.*		*Circle.*	
		Abscissae	A	B	Distance from axis minor to curve.	C	Semi-ordinate to axis major.	D	Cosines of circle.	E
0	56	0.000	8.000	0.000	521.166+	8.000	6.000	8.000	524.136	8.000
1	55	0.000	8.000	8.030	521 166+	8.000	6.000	8.000	524.136	8.000
2	54	0.003	8.003							
3	53	0.008	8.008							
4	52	0.015	8.015							
5	51	0.019	8.019							
6	50	0.034	8.034	8.241	521.200	8.034	5.974	8.026	524.102	8.034
7	49	0.047	8.047							
8	48	0 061	8.061							
9	47	0.077	8.077							
10	46	0.095	8.095							
11	45	0.115	8.115	8.453	521.282	8.116	5.912	8.088	524.020	8.116
12	44	0.137	8.137							
13	43	0.161	8.161							
14	42	0 187	8.187							
15	41	0.215	8 215							
16	40	0.244	8.244	8.676	521.411	8.245	5.813	8.187	523.891	8.245
17	39	0.276	8.276							
18	38	0 310	8.310							
19	37	0.345	8.345							
20	36	0.382	8.382							
21	35	0.422	8.422	8.911	521.589	8.423	5.674	8.326	523.713	8.423
22	34	0.463	8.463							
23	33	0.506	8.506							
24	32	0.551	8.551							
25	31	0.598	8.598							
26	30	0.646	8.646	9.160	521.812	8.646	5.493	8.507	523.489	8.647
27	29	0.697	8.697							
28	28	0.750	8.750							
29	27	0.804	8 804							
30	26	0.861	8.861							
31	25	0.919	8.919	9.423	522.085	8.910	5.265	8.735	523.218	8.918
32	24	0.979	8.979							
33	23	1.042	9.042							
34	22	1.106	9.106							
35	21	1.172	9.172							
36	20	1.240	9.240	9.700	522.406	9 240	4.984	9.016	522.898	9.238
37	19	1.310	9.310							
38	18	1.381	9 381							
39	17	1.455	9.455							
40	16	1.531	9.531							
41	15	1.608	9.608	9.996	522.774	9 608	4.630	9.361	522.520	9.607
42	14	1.688	9.688							
43	13	1.769	9.769							
44	12	1.852	9.852							
45	11	1.937	9.937							
46	10	2.024	10.024	10.300	523.190	10.024	4.216	9.784	522.113	10.023
47	9	2.104	10.104							
48	8	2.204	10.204							
49	7	2.297	10.297							
50	6	2.392	10.392							

Height from top of Shaft.	Height from top of Rock.	Parabola.		Hyperbola.			Ellipse.		Circle.	
		Abscissæ	A	B	Distance from axis minor to curve.	B	Semi-ordinate to axis major.	D	Cosines of circle.	E
51	5	2.489	10.489	10.644	523.655	10.492	3.688	10.712	521.648	10.488
52	4	2.587	10.587							
53	3	2.688	10.688							
54	2	2.700	10.700							
55	1	2.894	10.894							
56	0	3.000	11.000	11.000	524.166	11.000	3.000	11.000	521.136	11.000
57	under courses. 1	3.109	11.109							
58	2	3.219	11.219							
59	3	3.331	11.331							
60	4	3.444	11.444							
61	5	3.560	11.560	11.380	524.724	11.558	3.562	12.010	520.574	11.563
62	6	3.678	11.678							
63	7	3.798	11.798							
64	8	3.919	11.919							
65	9	4.043	12.043							

These tables are constructed in the following manner:—

In the Parabolic Curve. *Table A.* The column is generated by the revolution of the curve *a b* about *d e* as an axis. The radius *a d* which is at the top of the column being 8 feet and at *b e* which is the level of the highest point of the rock being 11 feet, *d c* is the axis of the parabola whose vertex is at *a*. *a c* is an abscissa equal to 3 feet and *c b* its semi-ordinate equal to 56 feet. These data being given it is required to find the particular parabola that passes through the points *a* and *b*.



Let x equal latus rectum, then

$$x = \frac{56^2}{3} = \frac{3136}{3} = 1045.3+$$

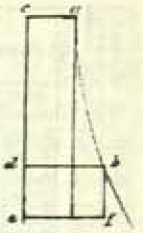
The value of x being found and the semi-ordinates or heights of the column being known to find the abscissae appertaining to any given heights of the column.

Let y equal any abscissa and z equal its semi-ordinate, then the equation for their calculation will be

$$y = \frac{z^2}{1045.3+}$$

hence 8 feet which is the radius of the column at top being added to the abscissae gives the radius at any other height, as shown in table A.

In the Hyperbolic Curve. *Table B.* The column is generated by the revolution of the curve of a rectangular hyperbola *a b* upon the asymtote *c d*.

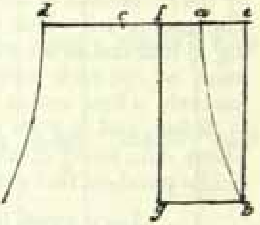


c d is the height of the column equal to 56 feet, the radius at top or semi-co-ordinate *c a* equal to 8 feet, and the radius at bottom or semi-co-ordinate *d b* equal 11 feet. It is required to find from these data the particular hyperbola that passes through the points *a* and *b*.

Let x equal $d\,e$ then
$11\,x = 8\,(x+56)$ whence
$x = 149.33+$

$\therefore\ 8 \times 56 + 149.33 + = 149.33^{+} \times 11 =$ the constant 1642.6+
To find any other radius of column, let radius sought equal to y, and let z equal to the height appertaining to that radius then $y = \dfrac{1642.6 +}{z + 149.3 +}$ which is the equation for computing the radii as given in table B.

Again *in the Hyperbolic Curve. Table C.*—Let *c* be the centre of a rectangular hyperbola and *d e* its axis, let *e b* a semi-ordinate be the height of the column = 56 feet and *e a* one of its abscissae = 3 feet. Then the column will be generated by the revolution of the curve *a b* round *f g* which s parallel to the axis minor. The radius at the top of the column *f a* being 8 feet and at the bottom *gb* equal to 11 feet.



Let x be the other abscissa to the ordinate $b\,e$ then

$$x = \frac{56^2}{3} = 1045.3$$

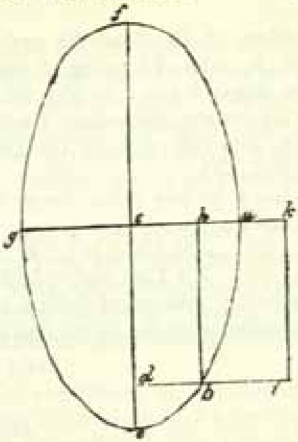
from which is derived $c\,e = 524.16 +$ and the constant $c\,a = 521.16 +$

Let y equal $c\,e$ and $z =$ its semi-ordinate $e\,b$ then

$$y^2 = 521.16^2 + z^2$$

$y = \sqrt{521.16^2 + z^2}$ which is the equation for calculating the value of y at any other height of the column, subtracting from which the semi-diameter $c\,a = 521.16 +$ and adding the radius of the column at top, 8 feet, will give the radius of column at such height, as shown in Table C.

In the Ellipse. Table D.—Let *k i* equal 56 feet, be the axis of the column, *a k* and *b i* radii at the top and bottom 8 and 11 feet respectively. The column will be generated by the revolution of the curve *a b* round *k i*. Let *h b* a semi-ordinate to the minor axis *ag;* equal 56 feet, *ah* an abscissa equal to 3 feet, make *ch* also 3 feet then the other abscissa *hg* will equal 9 feet; from these data to find the semi-axis major *ce*.



From the known properties of the ellipse.

$$ce^2 = \frac{hb^2 \times ca^2}{ah \times hg} = \frac{56^2 \times 6^2}{3 \times 9} \text{ whence } ce = 64.663 \text{ feet.}$$

$$de = 8.663 \quad df = 120.663 \text{ and } fe = 129.326.$$

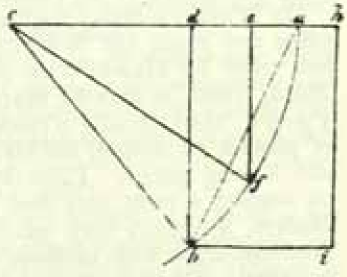
Then to find any semi-ordinate *d b* to the axis major; let *d b* equal x.

$$x^2 = \frac{de \times df \times ca^2}{ce^2} = \frac{8.663 \times 120.663 \times 6^2}{64.663^2} = 9 \text{ whence}$$

$$x = 3.$$

ca^2 and ce^2 being constant, by altering the abscissae on the axis major according to the height of column required, any other semi-ordinate to them may be found, now by adding the semi-axis minor *ca* at the top of the column, to the radius of column at the same height, and subtracting therefrom the semi-ordinates to the axes major of the other heights required, the remainders will give the radii of the column at these heights as in Table D.

In the Circle. Table E. Let *hi* be the height of the column equal to 56 feet, *a h* the radius at top equal to 8 feet and *bi* the radius at bottom equal to 11 feet. To find the radius at any other part of the column. Produce *a h* to *d* and make *a d* equal to 3 feet. From *d* let fall *d b* perpendicular to the line *h d*, make *d b* equal to *hi*, then *b d* : *da* : : R : Tan *b* from whence the angle at *a* is found and the side *ab*. Produce *ad* and draw the line *b c* having the angle at *b* equal to the angle at *a* then the sides *ac* and *b c* will be equal. From *c* the point of inter-



section of the lines *bc* and *ac* describe an arc passing through *a* and *b*, then *d b* being at right angles to *ca*, it will be the sine of the angle *b c a*. In the triangle *a b c* one side *ab* and the angles being known the sides *b c* and *c a* which are equal can be found—viz. 524.136 and in the triangle *b c d* the side *c d* will be equal to 521.136.

Let *f* be any point whose height *ef* from the top of the column is known, then

524.136 : *ef* : : R : Sine of *e c f* whence
R : Cos *ecf* : : 524.136 : *e c*

e c being subtracted from *c h* the remainder will be the radius of the column at the point *f* as shown in Table E.

APPENDIX II.

Piracy at the Southern entrances of the Straits of Malacca during five years; viz. 1846, 47, 48, 49 and 50, being notices contained in the "Free Press" Journal of such cases that had come to light.

A daring attack was last week made upon a Cochin-Chinese tope outside by two sampan pukats manned by Chinese and a few Malays. They were beat off by the Cochin-Chinese who came into harbour on Saturday last and several of whom were wounded.—Singapore Free Press, 7th May, 1846.

On Saturday last as a Chinese tonkang containing 5 men was returning from Singapore to Nongsa, on the opposite side of the Straits, with a cargo consisting of 10 piculs rice and some opium, it was chased about 3 P. M. while in sight of the harbour near Oedjong Kring, by a Malay prow manned by 7 men and 1 woman. The Malays fired into the boat and also threw spears, by which four of the men were killed, the other man hid himself below. The boat was then plundered of the rice, opium and clothes belonging to the Chinese.—Ibid. 25th June, 1846.

On Monday a Malay man named Wahap appeared at the Police office and made the following statement:—On Thursday last he and other 11 Malays were proceeding to an Island named Ayer Etam, which is situated beyond the Carimons, to collect Gutta Percha, when about 7 o'clock in the evening they saw a number of persons on a spar, not far from the Island, who were standing and beating gongs. There were 15 sampans on the beach, and on turning a point they met two large boats containing Gallang Malays, by whom they were immediately attacked. The pirates fired six times with muskets and rifles, by which one man was wounded. On the pirates coming up with the other boats, the Malays jumped into the water and swam ashore. The pirates after sinking one of the boats proceeded in the direction of Pinang. The Singapore boats had 1 kris panjang, 3 krisses, 9 spears, and 1 blunderbuss on board. After the pirates left, the Malays swam to the other boat, which had got adrift and by the aid of an old kadjang and rowing they reached Singapore in 3 nights and 2 days. All the property in the boats was carried off by the pirates. It consisted of a coyan of rice, ½ piece of chintz, ½ piece of white cloth, cooking utensils and the arms above mentioned.—Ibid. 13th August, 1846.

We learn that the Sooloo pirates are at present briskly prosecuting their nefarious trade and have been very successful lately. They appear to have ranged far and wide, and amongst the slaves brought by them were some from the Island of Banka. The Sooloo pirates have been long known as most remorseless and daring pirates &c.—Ibid. 10th Sept. 1846.

It having been reported to the Government by the Rajah of Sinkip, that a prow containing three dead men had been found drifting near that place, the gun-boat "Charlotte" was dispatched to investigate the matter. She arrived on the afternoon of Friday last, and found the prow and the bodies, one of them showing several wounds on the breast, whilst the other two were in such an advanced state of decomposition that they could not be approached.—Ibid. 17th Sept. 1846.

It would seem from information we have received, that the Coasts of Singapore and the neigbouring mainland are beginning to be infested by a very disagreeable description of visitants in the shape of Chinese pirates, who conduct their operations by night. We learn that lately a band of Chinese attacked, plundered and burned the hamlet of Pasir Gundih, situated on the Estuary of the Johore river, at some distance below Johore Lama. On another occasion they attacked and pillaged the hamlet of Pangerang in the vicinity of Marbukit, but whither they have burned it or not we have not been informed. Both these attacks were made in the night time. The inhabitants of the various villages and hamlets in that direction, whether on the mainland or Singapore, are much alarmed by these daring outrages and are in expectation of being attacked in their turns.—Ibid. 22nd July 1847.

We have just been informed of a case of Piracy near Rhio. It appears 4 Klings were employed in cutting wood, when they were attacked by two piratical boats with about 40 men, armed with krisses &c. After taking all the property belonging to the Klings the pirates wounded two of the four, one very severely, who are now in hospital.—Ibid. 19th August, 1847.

On Tuesday last, in consequence of information received at the Police Office, a Constable and two Peons repaired to Siglap and Tannah Merah, where they found a tonkang with two Chinese in it severely wounded. It appears from the statement of these men, that four days previously they left Singapore with a companion for the purpose of cutting wood. That on the following night about 1 o'clock they were attacked by a party of Malays, by whom their companion was killed and thrown overboard, and they themselves desperately wounded. The boat was then plundered of the small store of provisions it contained, of rice, dried fish &c. and left by the Malays. The wounded men remained in this helpless condition until they were discovered, having nothing to subsist upon save a small piece of dried fish.—Ibid. 2nd Sept. 1847.

It appears from what we have learned lately that Singapore is becoming the head quarters of as daring and reckless a body of pirates as congregate at Sooloo itself. Some months ago we gave details of an expedition which had been fitted out in the mangrove shaded rivers, at the back of this island, in the Old Straits and which carried bloodshed and destruction amongst the population of one of the Dutch Islands in the neighbourhood. About a month and a half ago another regular piratical squadron sailed from Singapore river, on a plundering expedition, consisting of 2 large gambier boats and 2 sampans, their strength altogether amounting to 100 Chinese. Their pretended errand was to collect Gutta Percha on some of the Islands in the Straits, and they took with them nothing but the rice and provisions necessary for their subsistence. They cleared out at the proper office and received the usual pass and bent their course to Moar, in the Peninsula, where they made an attack upon a Kampong but were repulsed. They then crossed over to Siak, in Sumatra, and tried their luck, but were again unsuccessful, being driven away. From thence they came down to a small Island, Pulo Buru, where they again experienced discomfiture in their attempts to plunder some houses, some of their body being killed and some wounded. The Malays who were in the houses also suffered, but not so severely as the Chinese. While near this island they attacked a Malay boat, the crew of which, five in number, they put to death, and taking out the rice &c. scuttled the boat. After their last repulse they appear to have thought that the fates were against them, for after burying their dead on a small island on their route, they returned to Singapore, as empty handed as when they left. Driven to extremities they appear to have resolved to try their fortunes on land, and on the morning of the 22nd ultimo a large detachment of the gang, about 40 or 50 in number, attacked a house in Campong Glam, inhabited by Malays, which, after forcing open the door by an extempore battering ram and wounding some of the inmates, who thereupon all fled, they plundered, carrying off about 30 or 40 dollars and other property. Their ill-luck however attended them, as the alarm having been raised, they were followed by the mounted patrol, who chased them along the Changei Road, wounded some of them and recovered all the stolen property and some of their weapons, which in their flight they threw away. Having betaken themselves to the jungle they escaped, but some of them were apprehended next day.—Ibid. 6th Jany. 1848.

Last week one of the Christian (Cochin-Chinese) topes was attacked by a Malay boat and several of the persons on board wounded, one of whom has since died. The attack was witnessed from the Steamer "Hooghly," whose boats immediately proceeded to the spot, but the Malays on perceiving that the Steamer was sending assistance to the tope, desisted from the attack and aided by the darkness effected their escape. Some other native vessels have since been attacked, amongst others a Siamese junk, which was plundered of several chests of opium and other valuable property. The latter piracy is reported to have been committed by a red-head junk in concert with several other small junks.—Ibid. 27th April, 1848.

A few nights ago an attack was made on some gambier plantations at Tanjong Kring, on the Island of Battam, by about 200 Chinese, who burned down the bangsals and murdered 10 persons. It is supposed that the perpetrators of this outrage were from Singapore.—Ibid, 1st June, 1848.

A most daring outrage was enacted on Thursday last within a few miles of the Town, which shows the lawless nature of our population and the little dread they entertain of the power of the Authorities to bring them to punishment. A Chinese prow pukat which had been at Singapore town with gambier and pepper, left on Tuesday last to return to the Bangsal to which it belonged in Sungie Tengeh at the west entrance of the Straits of Singapore, having a cargo of rice, fish, tobacco, &c. and about 25 Chinese on board, belonging to the gambier plantations at the river. After entering the river the pukat grounded, at a point where the river makes a bend, and at a distance of about 2 miles from the place to which it was proceeding, when it was suddenly attacked by 6 sampans containing 30 or 40 Malays, who discharged a shower of nibong spears at the Chinese, by which 2 were killed and 20 wounded. The Chinese being unarmed could make no resistance but jumped into the water and made their escape through the mangrove. The Malays then pillaged the boat which they completely emptied, destroying what they could not carry away.—Ib. 1st June 1848.

At Pulo Simakow, a Chinese village was attacked and plundered, 14 Malays armed with krisses and spears, made a rush into the village, but all the Chinamen succeeded in making their escape, except one unfortunate man, who was run right through the body with a spear. The houses were plundered and the party left.—Ib. 25th Jany. 1849.

Some of the China junks have, we are sorry to say, resumed their habits of plundering native craft outside of the Straits of Singapore. A short time since a Malay boat proceeding from Singapore to Tringanu was fired into by a Chinese junk and one of the crew killed, and after which the boat was plundered and then set adrift with her crew.—Ibid, 19th April, 1849.

Pirates are still rife both up and down the Straits and the native traders are beginning to be considerably alarmed. The gun-boat the other day gave chase to a long sampan pulling 10 oars, but the pirates distanced the slow gun-boat with ease and even insulted the unfortunate Company's vessel by hoisting a flag and inviting it to approach. This is really too bad.—Ibid, 10th May, 1849.

Last week the gun-boat captured a piratical prow near Point Romania but unfortunately the crew escaped. A small party from the gun-boat had landed and their attention was attracted by what appeared to be a fire in the jungle. On approaching they found a boat concealed amongst the bushes and that a party of men had retreated into the jungle. Being few in number the gun-boat men proceeded to their vessel and reported the circumstance on which a larger party was sent, who took possession of the piratical craft, which proved to be a large sampan, probably that which had been chased some days previously by the gun-boat. It was found to contain a lela and numerous bundles of bambu spears. What confirmed the suspicion of its being a piratical boat was the circumstance of a number of Cochin-Chinese hats and a quantity of Cochin-Chinese rice being found in it; no doubt plundered from some craft cut off by the pirates.—Ibid, 17th May, 1849.

The pirates between this and Malacca still continue their depredations on the small craft that pass up and down between the two places. A sampan left Malacca for this some days ago but being attacked by pirates put back to the former place.—Ibid, 20th June, 1849.

On the 2nd of May last two Cochin-Chinese boats left this for Cochin-China, one being 33 coyans and the other 20 and having a considerable number of persons on board. They were escorted as far as Pedra Branca by the gun-boat which then left them and returned to Singapore. The gun-boat had scarcely departed when they were persued and fired upon by two Malay prows, but the Cochin-Chinese having fortunately some muskets on board returned their fire, on which the Malays sheered off. On the 7th the foremost of the Cochin-Chinese boats found itself at break of day in the presence of a fleet of 10 Chinese junks; three being somewhat apart from the others, so as to intercept the Cochin-Chinese boats in the event of their trying to escape. A suspicious movement on the part of the three junks alarmed the Cochin-Chinese who tried to escape by changing their course but it was too late. The pirates got hold of them and plundered the boat of every thing carrying off property to the amount of several thousand dollars, and only leaving them some provisions to continue the voyage to Cochin-China, where they arrived in due course. The other was not more fortunate, it also fell into the hands of the fleet by whom it was stripped of every thing only leaving a scanty supply of water, rice and dried fish, which fortunately subsisted the persons on board until their arrival in Cochin-China. The same boat during the course of the voyage twice again fell into the hands of Chinese pirates, and on one occasion so frightened were some of the Cochin-Chinese that they threw themselves into the sea, but were taken on board again without injury. They received much ill-usage from the pirates, who wished to compel them to discover where they had hid the money and opium which it was thought were somewhere concealed in the vessel, and the Cochin-Chinese were forced to turn over the sand ballast of their vessel three or four times, to allow the pirates to look for the money. Many other Cochin-Chinese boats have this season on their return from Singapore suffered the same fate at the hands of both Chinese and Malay pirates. One amongst the rest, captured by Malays, had only five persons on board, three men and two boys; two of whom were severely wounded and the men only escaped death by throwing themselves into the sea, on planks, they were picked up two days afterwards by Chinese pirates, and by them landed on the coast of lower Cochin-China.—Ibid, 17th August, 1849.

We learn that intelligence has just been received by his highness the Tumongong of a formidable band of Lanun pirates having appeared in the neighbourhood of Lingin and made various descents on its shores. A few days ago they attacked Sinkip and carried off 40 men, women and children, who are stated to be immediate dependants of the Rajah. This formidable eruption of pirates has put a stop to the trade between this and the islands to the south of Singapore; the boats with tin, gutta percha, &c., not daring to venture to sea for fear of falling into the hands of the pirates. We are informed that the Tumongong lost no time in making the authorities acquainted with the appearance of Lanun pirates in our immediate vicinity, and he suggested that the H. C. Steamer "Nemesis" should be dispatched to look for them.—Ibid, 29th April, 1849.

Accounts were received here on Tuesday last of a band of Lanun pirates having appeared in the neighbourhood of the islands of Banka, Lingin &c. who had already on the departure of the messengers done considerable mischief. They attacked the native village of Sinkip which was of considerable extent and burned it to the ground and carried off 80 men, women and children. The pirates were represented to have 10 large prows well manned and armed. The warriors of Lingin had gone out in boats with the purpose of encountering them, but their appearance was so formidable that the Lingin force deemed it prudent to retreat and messengers were then despatched to Singapore, with information of their presence and to entreat assistance from the Tumongong, of Johore. In compliance with the request of the Tumongong, the H. C. steamer "Nemesis" departed on Thursday to look for the pirates and was followed on Friday by the H. C.

Steamer "Hooghly," the latter taking his highness the Tumongong. It is to be hoped they will be successful in meeting the pirates. Captain Smith of the schooner "Louisa" which arrived here on the 29th reports that he was chased by these pirates and but for the superior sailing of his vessel would have fallen into their hands.—Ibid, 3rd May 1849.

(Note.—The Steamers did not fall in with them but afterwards the "Nemesis" fell in with the fleet on the coast of Borneo, discomfited them and rescued several of the captives carried away from Sinkip.—J. T. T.)

The Chinese junks would appear to have commenced their annual piracies after leaving Singapore with great briskness this season. This week we have intelligence of no less than two attempts, in both of which it is satisfactory to know that the pirates were beaten off with some loss. On Friday last information was given to the Marine Magistrate by Yusop, Jurmudi of a Malay tope of the burthen of 10 coyans with a crew of 8 men, that having about a month ago sailed from Sarawak touching and remaining at Sirhassan for 4 days, they in 15 days time reached Lobam a place near Batu Putih or Pedra Branca. There they fell in with a Chinese junk about 20 coyans burthen, which closing with the tope, fired into her and also threw stones. The Chinese then came alongside and attempted to board, but the crew of the tope offered a determined resistance, stabbing them with spears, by which 5 or 6 of the Chinese were killed. The pirates desisted and made out to sea, while the Malays continued their course to Singapore, bearing as a trophy of their victory one spear taken from the pirates. The junk had two masts, was painted black and had mat sails. In the other case the vessel attacked was a Cochin Chinese boat, a class which it will be recollected suffered severely last year from Chinese and Malay pirates. Having the experience of former seasons in mind, it appears that 2 Cochin Chinese boats of about 40 coyans each and with a crew of 9 or 10 men respectively engaged an English barque, the "Eagle," for a certain sum to give them convoy beyond the most dangerous part of their route. (The Editor in the next issue says that the statement of the "Eagle's" engaging to convoy the junks was a mistake, she only allowed the junks to accompany her). One was bound to Saigon and the other to the northern coast of Cochin China. They accordingly left Singapore on the 7th instant under escort of the barque, but on Saturday the weather being rough and the sea high they lost sight of their protector. They proceeded in the course however, hoping again to come up with her, but on Sunday the Saigon boat being a dull sailer was left behind by her consort of whom she lost sight. On Monday she had contrary winds and made but slow progress and during the course of the day she found herself in the neighbourhood of a Chinese junk being then about a day and a half sail from Pedra

Branca in the direction of Saigon. The Chinese on finding themselves near the Cochin Chinese, lowered a boat in which about 10 men took their place, armed with swords, spears, shields, large knives &c. and approached the Cochin Chinese vessel evidently with the intention of attacking it. When they were close alongside, the Cochin Chinese, who fortunately were provided with a few muskets, fired by which one Chinaman was killed and several wounded. The Chinese boat then returned to the junk and the latter bore down upon the Cochin Chinese to attack them, and another junk being also seen in the distance, the Cochin Chinese deemed it prudent to abandon their voyage, and accordingly put about and made the best of their way back to Singapore where they arrived without further adventures.—Ibid, 14th June 1850.

Last Tuesday a piratical attack, which was followed by pillage and murder, was committed on the high seas, at a short distance from the shores of our island in the vicinity of Mata Ekan near the Red Cliffs. A boat manned by 4 Chinese was attacked by 8 Malays who manned two Malay sampans. One Chinaman was killed with a spear and other was desperately wounded in the head on two places, and is at present in the hospital in a precarious state. The two other Chinese escaped by swimming and recovered their boat and the bodies of their unfortunate comrades after the criminals had departed.—Ibid, 28th June, 1850.

Last Wednesday evening 3 Chinese boats leaving town were chased by two boats manned with Malays, who fired two shots at them but from too great a distance to do any harm. This happened at night behind the great Red cliffs and the chase lasted till near Buddoh when a breeze springing up the Chinese distanced their pursuers by the use of their sails and by throwing overboard a part of their cargo consisting chiefly of rice.—Ibid, 10th July 1850.

On the 11th instant three Cochin-Chinese left town in a boat loaded with about 10 piculs of rice, some opium and clothes, which they intended to carry to a party of their countrymen who were cutting wood near a place called Batu Puteh, (Pedra Branca). At a short distance from the shore these unfortunate men were attacked by a party of Malays in two boats manned each by six men who fired at them and killed one and severely wounded two others. One got a bullet through the upper part of the leg while another bullet grazed the leg of the other. After a desperate fight finding resistance useless the two wounded men jumped into the water and happily succeeded in reaching the shore, where some fisherman took them up and brought them to Singapore, when they were received into the hospital.—Ibid, September 20th, 1850.

A prow which arrived here several days ago reports that the was a fleet of fifteen Lanun pirate prows in the Straits of Banca and that when near Rhio it noticed two Steamers in the distance. A Bugis boat from Java reports having been chased by pirates in the Karimatta passage but being light she contrived to distance them.—Ibid, 27th September, 1850.

A Malay recently returned from Johore informs us that two Gallang prows were in Johore estuary and the old Straits, plundering the wood cutters and other persons in boats and that they had also sacked several Chinese bangsals.—Ibid, 27th September, 1850.

A passenger in a Bugis prow from Macassar which arrived here on the 16th instant, states that 30 pirate prows were repairing at Billiton. It is probable that these are part of the fleet of Lanun pirates who have been cruizing about that part of the Archipelago for some time past and of whose presence various reports have reached this from time to time.—Ibid, 18th October, 1850.

There appears to be several squadrons of pirates in the Straits of Malacca at present which are harrassing the native trade between this, Malacca and Pinang. One fleet of 18 boats was lately seen off Tanjong Birnam, which, amongst other depredations committed by it had captured a Perak boat. A native boat which arrived here a few days ago reports having heard much firing off Batu Pahat and at Malacca received intelligence of a prow having been taken. The Nakoda of a Bugis prow lately arrived states that he had an engagement with the pirates on his voyage down the Straits but succeeded in making his escape. The pirates are said to be small Malay boats, and it is supposed they are from some part of the Rhio Archipelago.—Ibid, 18th October, 1850.

From Malacca we learn that on the 23rd ultimo, a descent was made by the crews of two piratical prows at a place near Malacca called Marlimo who attacked and plundered a native hut the inmates of which fled in great alarm. Subsequently the same prows plundered a boat at Kwallah Moar the persons in which including a woman made their escape to the shore. A Malacca Scotchie was also menaced by these prows which are remarkable from having part of their sails of cloth, but a breeze coming on she got away from them.—Ibid, 7th November, 1850.

APPENDIX III.

Estimate of the probable cost of erecting a Light-house on Pedra Branca, according to plan dated 12th May, 1848.

Granite Ashlar.			
Wall to level of rock 200 ft. × 18" × 16" at $15	300	..	
„ Platform 4,000 „ × 12 × 10 at $12	4800	..	
Parapet and wall of			
Cupola ...... 465 × 12 × 9..	465	..	
Platform........ 325 × 12 × 12..	260	..	

Cook House & privy 300 × 12 × 12	300	..		
Pavement of rooms 810 flags 12 inches sq	324	..		
			6,449	00
Brick-work and Masonry.				
Wall to platform..25,5150 bricks				
Vaults 2,8560				
Walls of Stair case 5760				
28,9470 at $30 per 10,000	868	40		
Lime 87 coyans at $5	435	..		
Carriage of sand from Romania	200	..		
Molasses, 58 piculs	87	..		
Water by Gun-boats and Steamer	..	..		
Bricklaying at $20 per laxa	580	..		
Masonry	400	..		
Cement to be made at Singapore under Government Surveyor with 8 convicts, estimated time 6 months at $2½ per month	120	..		
Lime, 10 coyans $25 and wood $40.	65	..		
			2,755	40
Carpentry.				
4 Glass Windows 4ft. × 2 ft. at $7	28	..		
4 Venetian do. 4 × 2 at $2	8	..		
4 Glass do. 3 × 2 at $5	20	..		
4 Venetian do. 3 × 2 at $2	8	..		
5 do. do. 2 × 2 at $1½	7	50		
5 Dead-lights 2 × 2 at $1½	7	50		
1 Battened door 6½ × 3½	30	..		
1 Iron do. 6½ × 3½	50	..		
I Small Crane	20	..		
6 Marbow doors 6½ ft. × 2½ ft	72	..		
7 Marbow ladders with iron inlaid steps	63	..		
6 Iron railings at landings	40	..		
1 Marbow door at platform 6 ft. × 2½ ft.	9	..		
2 Marbow do. for Cook-room & Privy 6 × 2½	18	..		
			381	00
Sundries.				
Stepping rock for foundations and stairs from sea-shore	200	..		
7 iron rings to be let into grooves behind the springing of each vault, estimated weight 22 piculs	220	..		
60 iron cramps for 3 first courses estimated weight 90 catties	10	..		
Lead for do. 9 catties	13	50		
130 iron cramps for platform, 195 catties	23	40		
Lead for do	30	..		
118 do. for wall of cupola and parapet, 177				

catties	21	24		
Lead for do	30	..		
35 copper cramps for cope stones, 52 catties	36	..		
Lead for do	10	..		
Derrick crane, excluding tackling to be furnished at the Government stores	20	..		
Temporary houses of workmen, overseers, surveyor and materials	500	..		
Fitting up cabin of gun-boat	50	..		
20 water casks	30	..		
20 small do. for cement	10	..		
1 cement kiln	10	..		
1 wooden pestle and mortar	4	..		
Scaffolding and temporary stages	50	..		
Paint and varnish	20	..		
Blowing up rocks in bight	40	..		
Boat-hire of materials in Singapore	100	..		
2 decked tonkangs with cables and anchors	300	..		
1 sampan	30	..	1,758	14
			11,343	54
Contingencies at 5 per cent			567	17
			11,910	71
Contractor's Profit			1,191	07
Spanish Dollars			13,101	78

Singapore, 19th May, 1848.

Estimate of additions to original plan as per letter No. 28 of 1850.

Platform	$388 ..
Garden	86 ..
Landing place	100 ..
Channels to catch rain water	50 ..
Wooden pier on south rock	200 ..
	$824 ..
Contingencies and unforeseen expenses	82 40
	$906 40

Estimate of Furniture.

1 Clock	$ 30 ..
1 Argand Lamp	10 ..
3 Hanging Lamps	9 ..
Tackle for heaving up provisions	100 ..
9 Bedsteads	27 ..

1 Telescope...........................	16	..
20 Water Barrels.......................	100	..
6 Brass Wash Basons	12	..
1 Boat	90	..
Davits for do...........................	40	..
8 Chairs	8	..
3 Tables	12	..
	454	..
Contingencies at 10 per cent..	45	40
Spanish Dollars..	499	40

APPENDIX IV.

Abstract of Expenditure incurred in erecting and completing the Horsburgh Light-house.

Granite—delivered dressed at Pulo Ubin 5,474 cubic feet, average cost per cubic foot $1.05 nearly.	5,744	51
Bricks—at Singapore 187,100 in no. 16 bricks to a cubic foot, per 10,000 $24.21..	453	95
Brass—cast to moulds in Singapore, 11 piculs 94 catties, average cost $30 per picul (133⅓ lbs)....	358	44
Copper—in bars in Singapore, 10 piculs at $42.43 per picul..	424	33
Iron—in bars in Singapore, 105 piculs 68 catties at $2.66 per picul..	281	12
Lime—delivered in Singapore,60 coyans 134 gantons at $2.50 per coyan..	150	42
Tonkang and boats including repairs	919	64
Wood—including doors, windows and temporary houses, cubic feet not known..	388	30
Cement- delivered in Singapore, 97 barrels, each 6,096 cubic inches, average cost $5.59 per barrel.	542	..
Lead—cast in moulds, 4 piculs 23½ catties, average cost $12 per picul......	50	83
Furniture—including beds, tables, chairs, lamps, mats, &c..	206	50
Paints—including all kinds used for various purposes	131	87
Rope and Tackle—including all used in lifting materials into the rock and building.. ..	447	10
Sundries—including attaps, rattans, baskets, boat-hire, kadjangs, carongs, oil, nails, steel, hammers, chissels, gunpowder, &c. &c..... ..	1,728	89
Wages of men—including masons, carpenters, blacksmiths, braziers, boat-men, coolies.... ..	3,057	71

Salaries—including foreman's salary and superintendent's deputation allowance....	2,893	75
Lantern, apparatus and lightning conductor £1,324 9s 6d at 4s 6d per dollar....	5,886	51
Spanish Dollars..	23,665	87

APPENDIX V.

Rules for Light-keepers.

1st.—The lamps shall be kept burning bright and clear every night from sun-set to sun-rise; and in order that the greatest degree of light may be maintained throughout the night, the wicks must be trimmed every four hours or oftener if necessary, and the keeper who has the first watch, shall take care to turn the oil valves so as to let the oil flow into the burner a sufficient time before lighting.

2nd.—The light-keepers shall keep a regular and constant watch in the light-room throughout the night. The first watch shall be from sun-set till eight, the next from eight to twelve, the next from twelve to four and the last from four till sun-rise. The keeper that has the first watch one night shall take the second watch the next.

3rd—Immediately after sun-rise it shall be the head light-keeper's duty to cleanse and polish the reflectors and refractors till they are brought into a proper state of brilliancy, he shall carefully cleanse the lamps and dust the chandelier. He shall supply the burners with cotton, the lamps with oil, and shall have everything connected with the apparatus in a state of readiness, as early in the day as possible, for lighting in the evening.

4th.—The assistant light-keeper shall cleanse the glass of the lantern, lamps, glasses, copper and brass work and utensils, the walls, floors, and balcony of the light-room, and the apparatus and machinery therewith connected. The tindals shall keep watch during the day, the first watch being from sun-rise to 8, the next from 8 to 12, the next from 12 to 4 and the last from 4 to sun-set. Their duty will be to observe what ships or other vessels pass or approach the rock, and report any remarkable occurrence to the head light-keeper that may take place; the station on watch will be the balcony of the light-room; their watches shall change alternately daily so that he who has the first watch one day shall have the second the next.

5th.—The tindal that is not on the watch shall with the lascars at sun-rise clean and polish the stair rails, the dwelling rooms and out offices, all of which must be finished before eight o'clock; after eight the tindal off watch with the lascars shall attend on the head light-keeper in getting out the stores and water, or attend to the landing of these and execute whatever other desultory employment there may be.

6th.—The light-keeper on duty shall on no pretence whatever leave the light-room and balcony when on watch at night. In case of his being forced to leave the light-room then he shall first call the other light-keeper, for which purpose a lascar will sleep in the light-room or balcony, and who can go and fetch the other light-keeper. The lightkeeper on duty shall *at his peril* remain on guard till he is relieved by the other light-keeper in person, either on such occasions or at the changing of the watch.

7th.—In case of the sickness of one of the light-keepers, then one of the tindals must take charge of the duty, and for which he will be paid extra 30 cents a night, which sum shall be deducted from the pay of such light-keeper, until he be either relieved by another light-keeper or resume his duties, a note of such an occurrence must be daily entered in the Light-house journal as long as it continues.

8th.—The principal light-keeper is held responsible for the safety and good order of the stores, utensils and apparatus of whatever kind, and for every thing being put to its proper use, and kept in its proper place. He shall take care that none of the stores or materials are wasted and shall observe the strictest economy and the most careful management, yet so as to obtain the best possible light.

9th.—The principal light-keeper shall daily serve out the allowance of oil and other stores for the use of the light-room. The oil to be measured by the assistant at the sight of the principal light-keeper. The water shall also be daily served out by him at the rate of two gallons per man so long as the water in the outer vault lasts, and at the rate of one gallon per man when water is taken from the inner vault.

10th.—The light-keepers shall keep a daily journal of the quantity of oil expended, the routine of duty and state of the weather, embodying any other remarks that may occur. These shall be written in the journal books at the periods of the day that they occur and they on no account must be trusted to memory. A copy of the journal must be ready by the end of each month for transmission to the superintendent.

11th.—The principal light-keeper is held responsible for the good order and condition of the household furniture belonging to the Light-house. This duty extends also to the cleanliness of the several apartments, passages, stairs, roofs, store-rooms, privies and ash pits, landing places, piers and brass work.

12th.—When stores of any kind are to be landed for the use of the Light-house, the light-keepers shall attend and give their assistance. The principal light-keeper must upon these occasions satisfy himself as far as possible of the quantity and condition of the stores received, which must be duly entered into the store book and monthly return book.

13th.—The principal light-keeper shall monthly examine the stores of oil and provisions and report to the superintendent any damage.

14th.—Should the supply of any of the Light-house stores at any time appear to the principal light-keeper to be getting short, so as thereby to endanger the regular appearance of the light, he shall immediately intimate the same to the superintendent, and he must be guided by prudence in reducing the stated number of burners until a supply be received.

15th.—The principal light-keeper shall keep the keys of all stores, and it is only on his being incapacitated by sickness that they shall be delivered to the assistant.

16th.—The light-keepers are required to be sober and industrious, cleanly in their persons and linens and orderly in their families. They must conduct themselves with civility to strangers, by showing the premises, it being expressly understood that strangers shall not be admitted into the light-room after sun-set. But no money or other gratuity shall be taken from strangers on any pretence whatever.

17th.—No natives of the *Orang laut* tribe should on any account be admitted into the house. Their character is piratical and they might take advantage of the opportunity to pillage the building.

18th.—As it is the sole duty of the keepers to attend to the Light-house, the whole must be kept in the most perfect order and any filthiness in the public or private rooms will be most severely punished; any spitting on the floor, throwing refuse over the window, cleaning the fingers against the walls, or any like habits must be carefully avoided. There is no excuse for this as all conveniences have been furnished.

19th.—The Light-house door must be barred at 8 P. M. and not opened on any account till 5 A. M. next day.

20th.—The breach of any of the foregoing rules and instructions shall subject the light-keepers to dismissal or such other punishment as the nature of the offence may require, on their becoming known to the superintendent. If not reported by the offender, it will be the duty of the other light-keepers to do so, who will be considered equally culpable if they join in concealing the offence.

APPENDIX VI.

NOTICE TO MARINERS.

HORSBURGH LIGHT-HOUSE.

Notice is hereby given, that a Light-house bearing the above designation in commemoration of the celebrated Hydrographer, has been erected on Pedra Branca, a rock which lies off the eastern entrance of the Straits of Singapore. The light will be exhibited on the night of the 15th of October, 1851, and every night thereafter from sun-set to sun-rise.

The following is a specification of the position of the Lighthouse; the dangers which come within the influence of its light, and the appearance of the light, by Mr J. T. Thomson, Government Surveyor:

The Light-house is situated according to the Admiralty chart in Lat. 1° 20′ 20″ N. and Long. 104° 25′ East from Greenwich, and by compass bears from Barbucet Point, East distant 12½ Nautical miles, and from the N. E. point of Bintang N. W. by W. ¾ W. distant 12 miles.

The following rocks and shoals lying in the way of vessels, and coming within the influence of the light, bear from the Lighthouse:

Compass Bearings.	*Distance in Nautical miles.*	*Description.*
E. by S.	⅜	Rock which shows at low water spring tides.
S.E. by E. ¾ E.	⅛	Rock with ½ a fathom on it at ditto.
S.E. by E. ¾ E.	10¼	Postillon rock with 1¾ fathoms on it at ditto.
S.S.E. ¼ E.	¾	S.E. rocks which always show.
S. by E. ½ E.	6	Diana shoal with 2¾ fathoms on it at low water spring tides.
South.	⅝	S. rocks which always show.
S. by W. ¾ W.	2	South ledge dries at ½ ebb.
S. by W. ¾ W.	7½	Shoal with 1¼ fathoms on it at low water spring tides.
S.W. ½ S.	11¾	Crocodile shoal with 3 fathoms on it at ditto.
W. ¼ N.	7¾	Rock with 2¼ fathoms on it at ditto.
W.N.W. ¾ W.	6	Stork rock dries at low water sp. tides.
W.N.W. ¼ W.	5½	Congalton's Carr with 1½ fathoms on it at ditto.
Between N.N.W. ¾ W. & N. by W. ½ W.	Between 4½ & 6	Romania shoal with 3½ fathoms on it at ditto.
N. by E.	10¾	North Patch with 4 fathoms on it at ditto.

The light will be known to mariners as a revolving bright light, which gradually attains its brightest period once every minute, and as gradually declines, until it totally disappears to the distant observer; whilst, when viewed from a short distance, it is never entirely invisible.

The lantern, which is open all round, elevated 95 feet above the level of the sea at high water spring tides, will be seen from the deck of a vessel at a distance of 15 Nautical miles.

As a beacon during the day the Light-house will be known by the following description:—It stands on a rock which measures 150 feet long and 100 feet broad and is 24 feet high at its highest point above the level of high water spring tides. The Light-house is a pillar of dressed granite and the lantern is covered by a spherical dome which is painted white.

W. J. Butterworth,
Governor of P. W. Island,
Singapore and Malacca.

Singapore, 24th September, 1851.

APPENDIX VII.

This account of the Horsburgh Light-house, having originally been intended merely for the information of the Authorities, I have confined myself in it to giving a description of the works and a recital of the operations and occurrences connected with the construction thereof; but in laying the same before the public, under the kind sanction of the Straits Government, the paper would be incomplete in a very essential point, were mention not made of what had been done with reference to the illumination of the Straits of Singapore previously, and particularly the measures taken by Government to advance the views of the promoters of this public work.

So early as the year 1826, at which time the Settlement of Singapore was yet in its infancy, the placing of Light-houses to guide vessels through the intricate parts of the adjacent Straits, had attracted public attention. In the "Singapore Chronicle", under date the 13th of April of that year, we are informed that several projects were in contemplation for the improvement of the town and the advancement of the general interests of the Settlement, the most important of these, the Editor remarks, in a commercial point of view is in the erection of Light-houses. Two are stated to have been authorized by the Supreme Government, to be erected without delay, one of which was to be placed on Tree Island and the other on Government Hill still, notwithstanding the anticipations of the Editor, the subject was not entertained again till the year 1838, when, as we are informed by the "Free Press", under date the 12th July of that year, the erection of a Light-house on one of the islands at the western entrance of the Straits of Singapore was under the consideration of Government, but that the opinions of nautical *cognoscenti* were divided as to the most proper position between Barn, Alligator and Coney islands, the last having the majority of suffrages. Surveys were made of these positions, by the late Mr G. D. Coleman, Government Surveyor, and that officer, who appears to have been in favor of Barn Island, forwarded plans and estimates of a Light-house for that site, with his letter to the Resident Councillor dated 29th October 1838. Mr Coleman having left Singapore and proceeded to Europe, plans and estimates were required from me for the same position and these I furnished at the latter end of 1841. No further steps have been taken to erect a Light-house on this position though no doubt it would be a work of great utility, as the grounding of vessels in its vicinity on the numerous Coral reefs, is of frequent occurence, and which would be prevented were this part of the Straits illuminated.

In the "Free Press" under date the 28th April 1842 we are informed that Messrs Jardine, Matheson & Co., the treasurers of the Canton subscriptions for a memorial to Horsburgh, had placed themselves in communication with the Government of the Straits Settlements, offering to hand over the amount, in the hope that a Light-house on Pedra Branca, to be named after the celebrated Hydrographer (agreeably to the wish of the Subscribers) should be erected there. At this period the Honorable Mr (now Sir George Bonham) was about to relinquish his government, so the subject was necessarily left to his successor. It was at an early period of the Government of the Honorable Colonel Butterworth C. B., that this public work amongst the many other pressing calls on his attention met with his full consideration. The fact of numerous shipwrecks having occured at the eastern entrance to the Straits of Singapore was a sufficient proof of the necessity of the work, and notwithstanding the many unavoidable delays involved in bringing the subject properly before the Supreme Government and difficulties encountered in making the many requisite arrangements for the carrying out of the undertaking, he pursued the measure to the end with that energy and earnestness which alone could insure success. With the view of selecting the best site his Honor addressed Captain Sir Edward Belcher R.N., at that time in Singapore, who caused a special survey to be made and forwarded a report, dated October 1st, 1844, recommending Peak rock, one of the Romania Islands, as the most eligible position. Plans for this position were accordingly prepared by the Government Surveyor by order of Government which were forwarded by Colonel Butterworth to the Supreme authorities for their consideration.

On the 20th November 1845, a deputation of the Singapore Chamber of Commerce waited on His Honor the Governor, to seek information as to what had been done or was likely to be done with reference to the Horsburgh Testimonial Light-house, and who were readily afforded the information sought. On the 1st December following, a meeting of the Chamber was held, when it was resolved that the East India and China Association in London, the Calcutta and Bombay Chambers of Commerce, Capt. Biden of Madras, the Subscribers in America (through Joseph Balestier Esq. U. S. C.) and the Subscribers in France (through the French Consul) be addressed and requested to make the funds collected for a Testimonial to Horsburgh available for the above object.

Before the works had been sanctioned or ordered to be commenced, communications were received from the Admiralty and India House, under date 18th April and 6th May 1846 respectively, in which Pedra Branca was suggested to the Governor of the Straits Settlements, as being the proper position for the Light-house, and this was eventually fixed upon by his Honor, after consulting his local officers, which determination thus accorded with the wishes of the original promoters.

The subject of plans and estimates for the Horsburgh Testimonial on Pedra Branca has already been fully entered upon, so it will now only be necessary to mention that on the Government pledging itself to construct the Pharos, the Canton funds were handed over to the Straits Authorities by Messrs Jardine, Matheson & Co., who were treasurers to the fund. The sum collected in 1836 amounted to 4,191 Spanish dollars, but by the great liberality of the above firm, who allowed compound interest to run, from that year to the date of giving over the funds in 1847, the sum had accumulated to 7,411 Spanish dollars 13 cents, which amount was received into the Government treasury.

I am indebted to the courtesy of John Purvis, Esquire, for a copy of the minutes taken at the public meeting of the original promoters of the Horsburgh Testimonial, which was held at Markwick's Hotel, Canton; they are as follows:

" For the purpose of taking into consideration the proper " measures to be pursued to render a lasting tribute of respect to " the memory of the late Captain Horsburgh, William Jardine, " Esquire, in the chair.—November 22nd, 1836.

" The meeting was opened by Captain Hine, who briefly stated " its object and suggested that if sufficient funds could be raised, " the purpose would be best answered by the erection of some " work of utility, as a Light-house on Pedra Branca in the Straits " of Singapore.

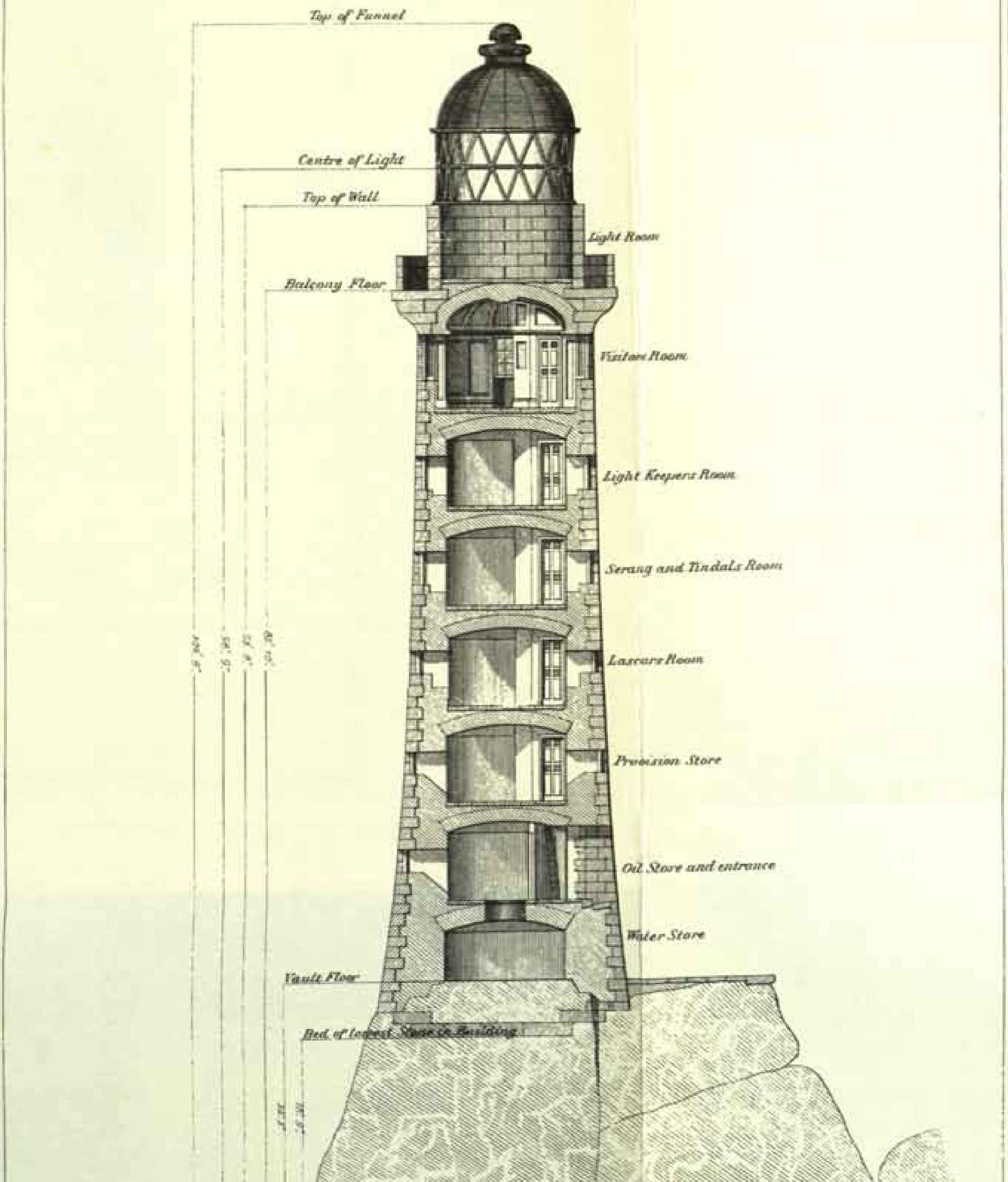
" Proposed by Mr Innes, seconded by Captain Grant, that the " following gentlemen be appointed as a committee to carry into " effect the object of the meeting, with power to add to their " number, viz.:—Mr Jardine, Captain Hine, Mr Fox, Mr Dent, " Mr Van Basil, Mr Framjee Pestonjee, Mr Wetmore, Mr Astell " and Captain Young.

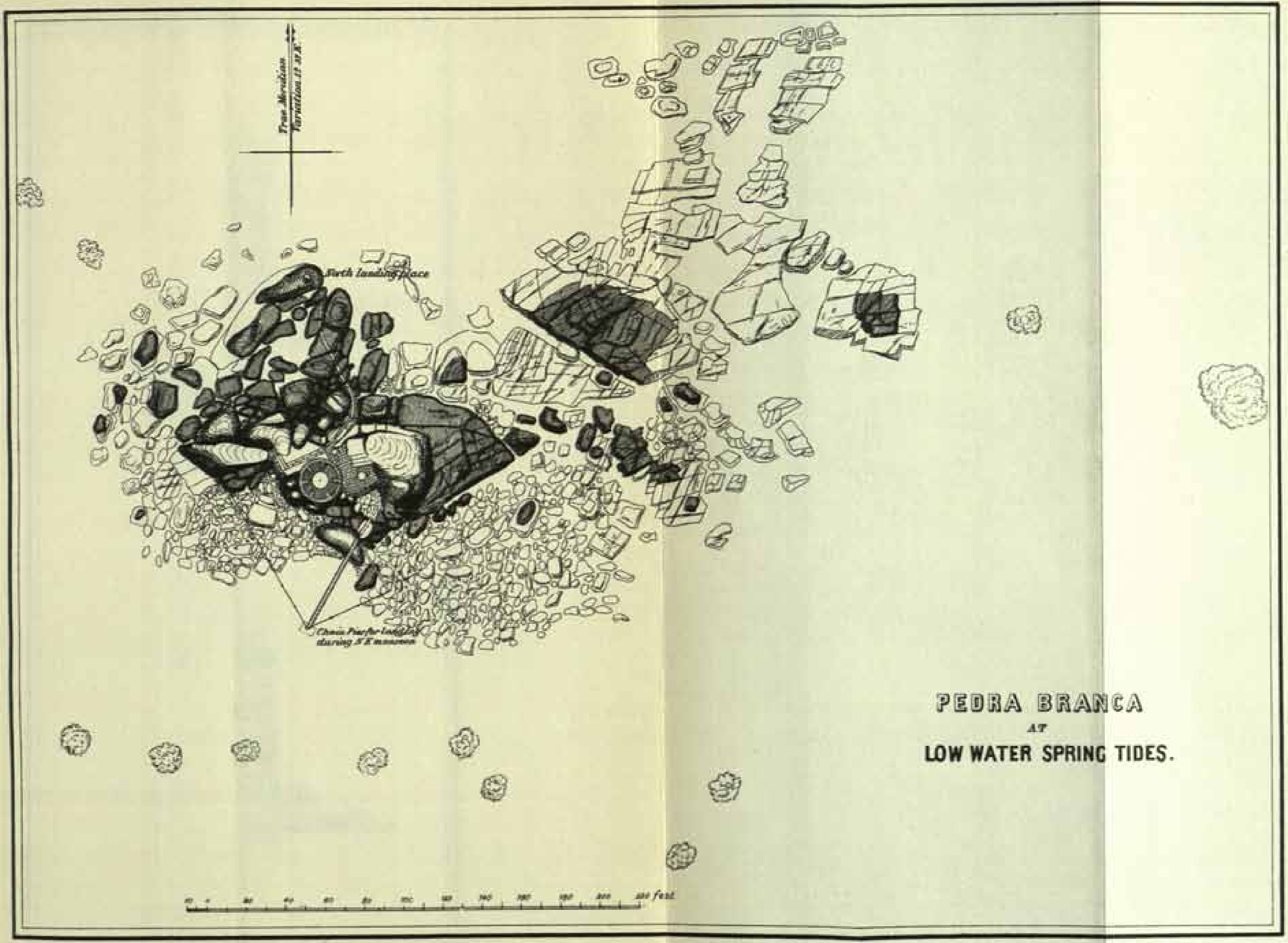
" Proposed and carried. That a Subscription list be now " opened and afterwards to lie at the different mercantile houses.

" Proposed and carried. That the thanks of the meeting be " given to the chairman."

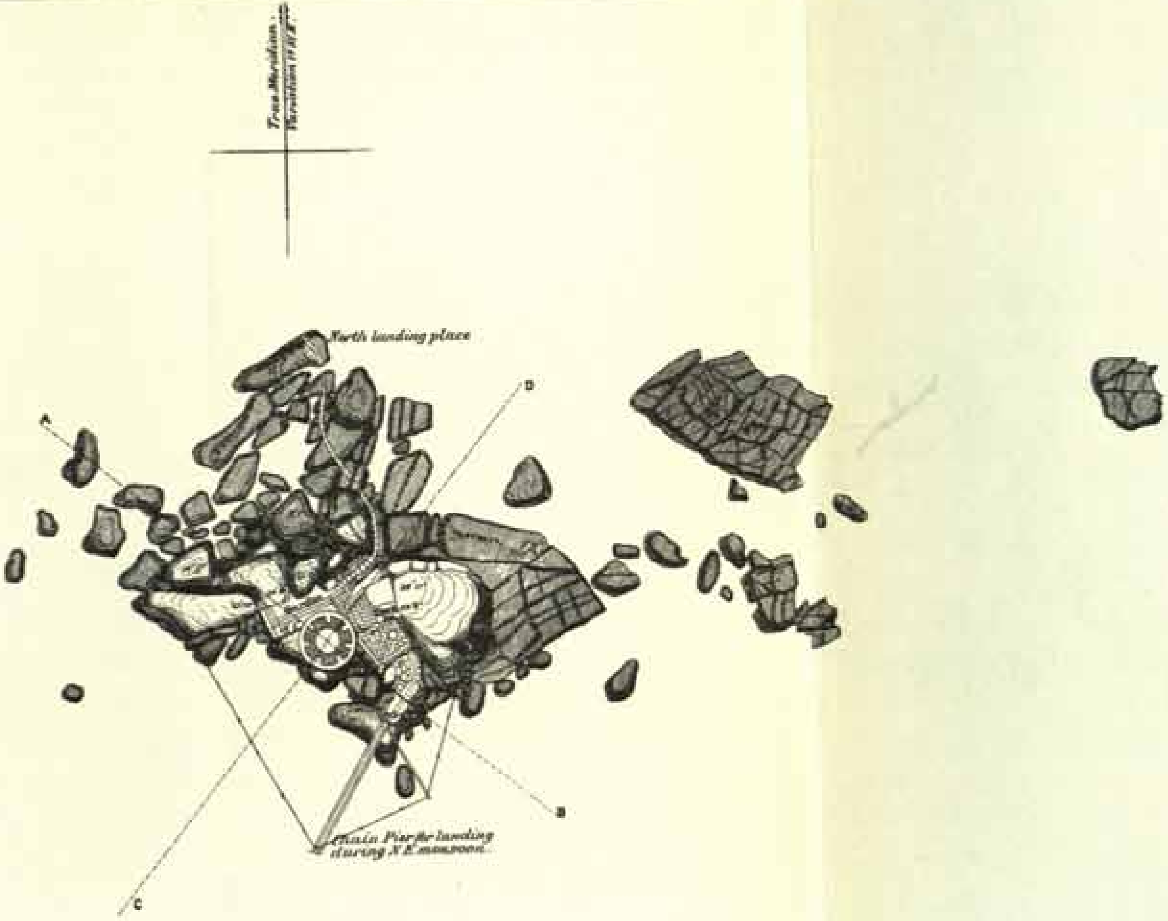
The Subscription list was headed by W. Jardine, Esquire, whose personal contribution amounted to 500 Spanish dollars, and the rest of the Subscribers were principally Merchants,

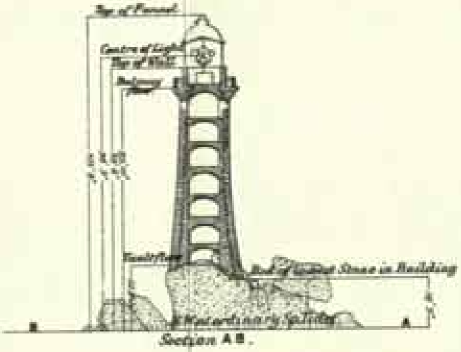
SECTION OF HORSBURGH LIGHTHOUSE NE&SW.




True Meridian
Variation
North landing place
Chain Pier for landing during N.E. monsoon
10 0 20 40 60 80 100 120 140 160 180 200 220 feet

PEDRA BRANCA
AT
LOW WATER SPRING TIDES.

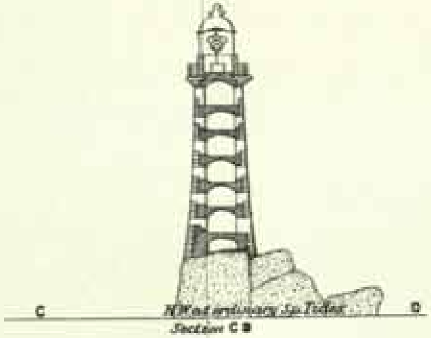




Section A B.

PEDRA BRANCA

AT HIGH WATER SPRING TIDES,
AND
SECTIONS OF LIGHTHOUSE.



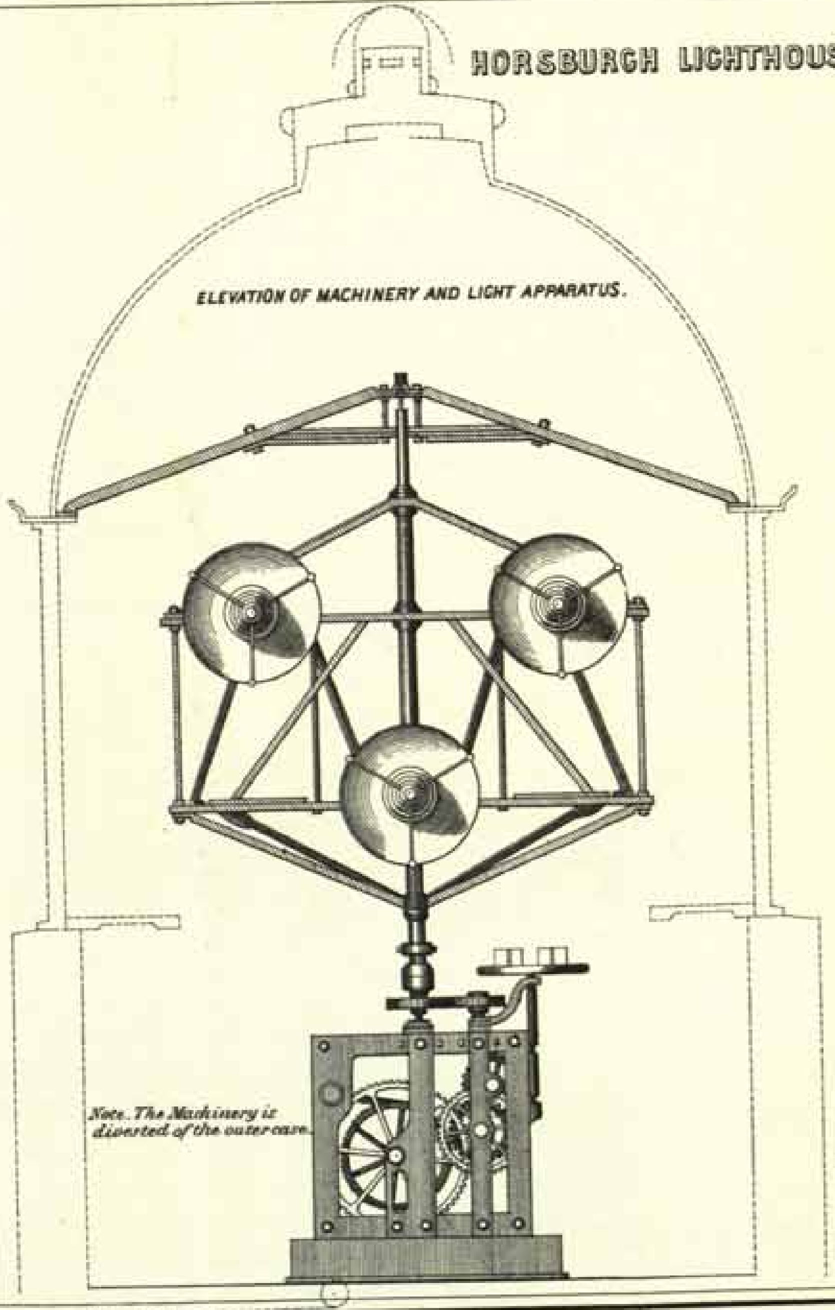
Section C D

Feet.

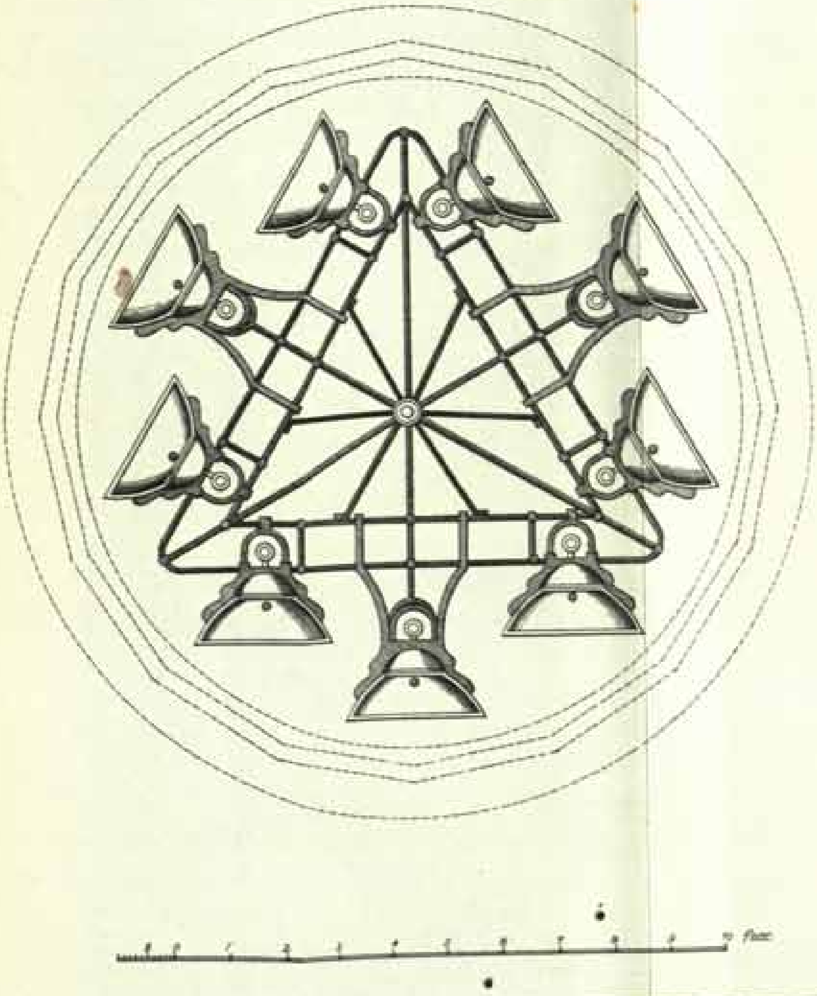
Heig'ts on Rock are above H.W. ordinary
Spring Tides.

HORSBURGH LIGHTHOUSE, MACHINERY AND LIGHT APPARATUS.

ELEVATION OF MACHINERY AND LIGHT APPARATUS.



PLAN OF REFLECTORS AND FRAME.



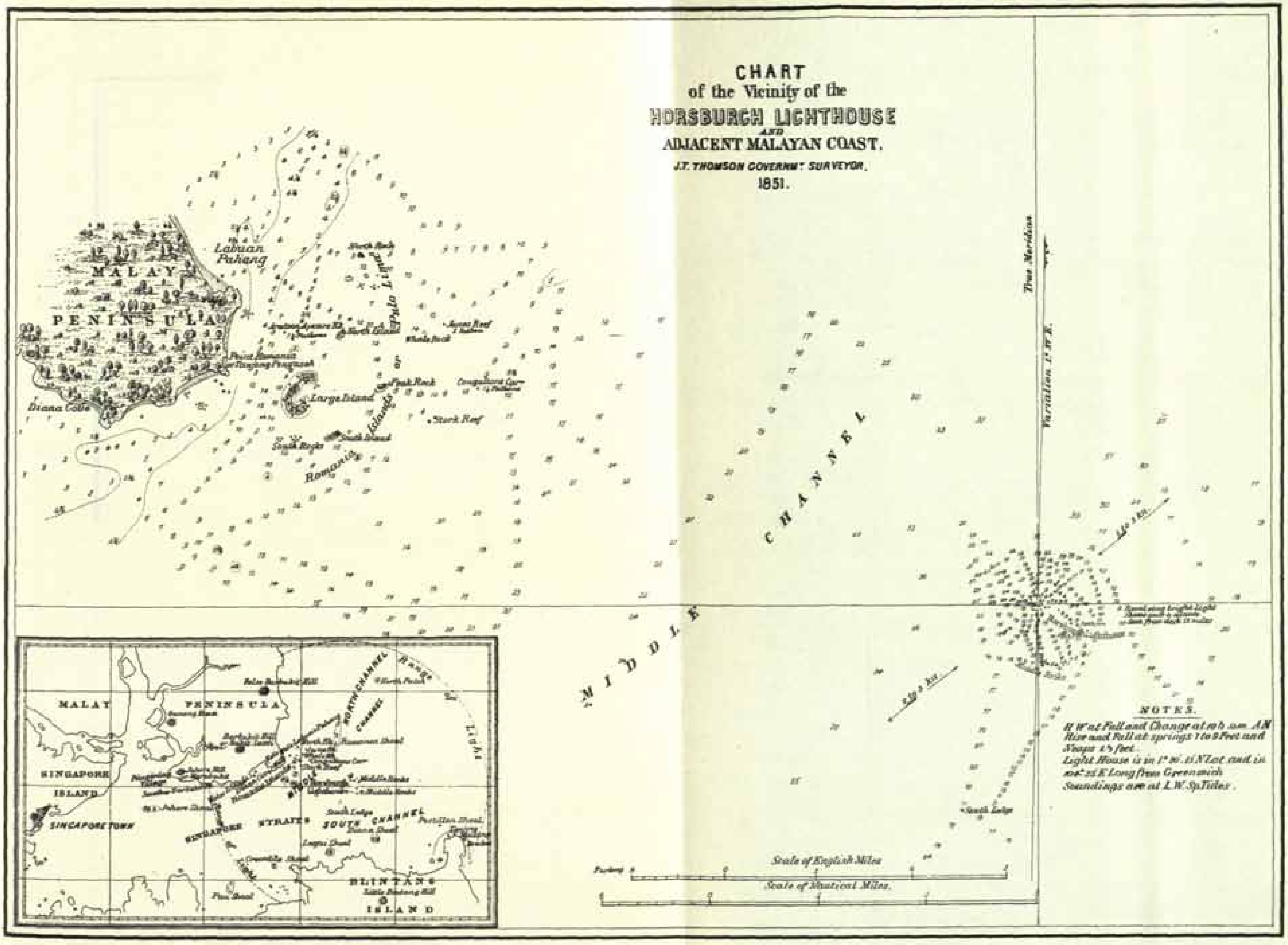


CHART
of the Vicinity of the
HORSBURGH LIGHTHOUSE
AND
ADJACENT MALAYAN COAST.

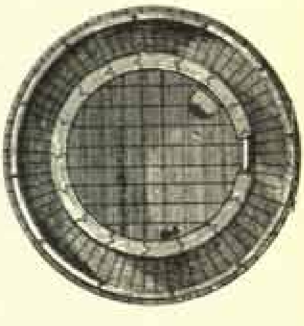
J.T. THOMSON GOVERNMT. SURVEYOR.

1851.

NOTES.

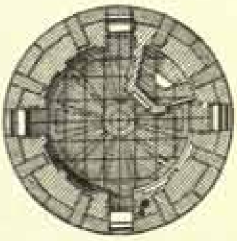
H W at Full and Change at 10h am. A.M
Rise and Fall at springs 7 to 9 Feet and
Neaps 4½ feet.
Light House is in 1° 20′. 15 N Lat. and in
104° 25 E Long from Greenwich
Soundings are at L. W. Sp. Tides.

PLANS OF HORSBURGH LIGHTHOUSE.



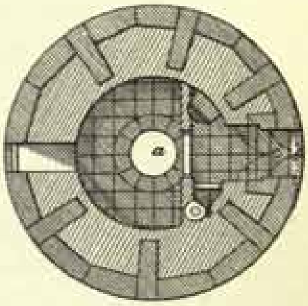
LIGHT ROOM AND BALCONY.

a Ladder
b Weight hole.



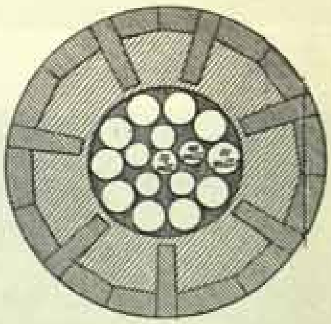
VISITORS ROOM.

The dotted lines represent
pannels of ceiling.
b Weight hole.



OIL STORE AND ENTRANCE.

a Trap door to Water Vault.
b Privy.
cc Doors.



WATER STORE.

[illegible] Gallons.

Commanders and Officers of Mercantile ships and other British subjects of Europe and Asia. The only considerable exception to this rule was in the Chinese Security Merchants who contributed liberally.

Besides the Canton Subscriptions, 4,299 Company's Rupees were forwarded to Government by the Bombay Chamber of Commerce, and 404 Company's Rupees by the Pinang Chamber of Commerce.

Sir Charles Forbes with distinguished liberality forwarded, as a personal contribution, the sum of Company's Rupees 1,632.

The remainder of the funds necessary to the completion of the Testimonial was advanced by the Government, to be repaid by a Light-house due on shipping. There was otherwise extensive aid afforded in the employment of their Steamers, gun-boats and officers, none of the expence of which was charged against the works. I have already had the pleasure of mentioning the highly gratifying assistance of the Dutch Authorities of Rhio, in placing gun-boats as tenders to the operations. The constant interest in the work testified by John Purvis, Esquire, of Singapore, and the services and information he rendered to Government from time to time, were warmly acknowledged by his Honor the Governor of the Straits Settlements, on the completion of the Pharos.

Singapore, 14th August, 1852.

Commissions and Offices of [illegible]

[illegible]

Mr. Charles [illegible]

The [illegible]

Bangalore, [illegible] August, [illegible]

THE

JOURNAL

OF

THE INDIAN ARCHIPELAGO

AND

EASTERN ASIA.

LEGEND OF THE BURMESE BUDHA, CALLED GAUDAMA.*

By the Revd. P. BIGANDET.

CHAPTER 3RD *(Continued.)*

ON beholding this wonderful appearance of all the lofty trees of the forest, the Princess felt a desire to approach nearer and enjoy the marvellous sight offered to her astonished regards. Her noble attendants led her forthwith at a short distance into the forest. Maia approached one of the resplendent Ingiing, (Shoua robusta) with the intention of breaking a small branch and carryit away. On that very instant, as the slender rotan, heated by fire, bends down its tender head, all the branches lowered their extremities, offering themselves, as it were, to the hand of the princess, who unhesitatingly seized and broke one of the young branches. By virtue of a certain power inherent in her dignity, on a sudden all the winds blew gently throughout the forest. The attendants having desired all the people to withdraw to a distance, disposed curtains all round the place the princess was standing on. Whilst she was in that position, admiring the slender bough she held in her hands, the moment of her confinement happened, and she was delivered of a son.

* Continued from page 289.

Four Chief Brahmas[28] received the new born infant on a golden network, and placed him in the presence of the happy mother, saying "give yourself up, O Princess, to joy and rejoicing, here is the precious and wonderful fruit of your womb."*

From the hands of the four Chief Brahmas, four Chiefs of Nats received the blessed child, whom they handed over to men, who placed him on a beautiful piece of white cloth. But to the astonishment of all, he freed himself from the hands of those attending upon him, and stood in a firm and erect position on the ground; casting then a glance towards the east, more than one thousand worlds appeared like a perfectly levelled plain. All the Nats inhabiting those worlds made offerings of flowers and perfumes, exclaiming with exultation "an exalted personage has made his appearance,—who can ever be compared to him who has ever equalled him? He is indeed the most excellent of all beings." Phralaong looked again towards the three other directions. Lifting up his eyes above and then lowering them down, he saw that there was no being equal to him. Conscious of his superiority he jumped a distance of seven lengths of a foot, in a northern direction, exclaiming—"here is my last birth—there shall be to me no other state of existence. I am the greatest of all beings."[29] He then began to walk steadily in the same direction. A chief of Brahmas[30] held over his head the white umbrellas. A Nat carried the golden fan. Other Nats held in their hands the golden sword, the golden slippers, the cope set with the rarest precious stones and other royal insignia.†

Thirty-two mighty wonders proclaimed the incarnation of Phralaong in his mother's womb, and the same number of wonders announced his birth to the earth. Moreover, in that same moment, were born the beautiful Yathaudra, the son of Amittaudana Ananda, the noblemen Tsanda and Kaludari, the horse Kantika.

---

* *Remarks of the Burmese Translator.*—When children are born, they appear in this world covered all over their bodies with impure and disgusting substances. But an exception was made in favor of our infant Phralaong. He was born without the least stain of offending impurity, he was ushered into this world, pure and resplendent like a fine ruby placed on a piece of the richest cloth of Kacika. He left his mother's womb with his feet and hands stretched out, with the dignified countenance of a Pundit descending from the place where he has expounded the law. Though both mother and child were exempt from the humiliating miseries common to all other human beings, there came down from the skies upon both by way of a respectful offering, gentle showers of cold and warm water succeeding each other alternately in regular order.

† *Remarks of the Burmese Translator.*—On two former existences, our Phralaong is said to have spoken a few words immediately after his birth, viz. when he was Mahauthata and Wethandra. On the first, he came into this world holding in his hands a small plant, which a Nat had brought and placed in his tender hands at that very moment. He showed it to his mother who asked him what it was. This is a medicinal plant, explained he to his astonished mother. The plant was cast into a large jar full of water and the virtualized liquid ever retained the power of curing every kind of bodily distemper. When he was born or rather began the existence which was called Wethandra, he stretched out his hand asking something from his mother which he might bestow on the needy. The mother put at his disposal one thousand pieces of silver.

The great tree Bodi also sprung from the ground, and the four golden vases suddenly reappeared.

The inhabitants of Dewah joining those of Kapilawot, set out for the latter country with the newly born infant, to whom they rendered the greatest honor. The Nats of the seat of Tawadeintha, on hearing that a son was born to Prince Thoodandana and that under the shade of the tree Bodi[31] he would become a true Budha with a perfect knowledge of the four great truths, gave full vent to their boundless joy, hoisting unfurled flags and banners in every direction in token of their indescribable rejoicings.

There was a celebrated Rathe, named Kaladewila, who had passed through the eight degrees of contemplation and who was in the habit of resorting daily to the Prince's palace for his food. On that very day, having as usual taken his meal, he ascended to the seat of Tawadeintha[32] and found the fortunate inhabitants of that seat giving themselves up to uncommon rejoicings. He asked them the reason of such an unusual display of ravishing transports of exultation. It is, replied they to the enquiring Rathe, because a son is born to Prince Thoodandana who will become a true Budha. Like all former Budhas he will preach the law and exhibit in his person and throughout his life the greatest wonders and a most accomplished pattern of the highest virtues. We will hear the law from his very mouth.

On hearing the answer of the Nats, Kaladewila immediately left the seat of Tawadeintha, and directed his aerial course towards the palace of Thoodandana. Having entered the palace and occupied the place prepared for him, he conveyed to the prince the glad tidings of a son having been born unto him.

A few days after this message, the royal child was brought into the presence of his rejoicing father. Kaladewila was present on the occasion. Thoodandana ordered that the child should be attired with the finest dress and fed in the presence of the Rathe, in order to pay him his respects. But the child rose up and placed his two feet on the curled hairs of the venerable personage. The persons present on the occasion, not knowing that a Budha in his last existence never bows down to any being, thought that the head of the imprudent child would be split into seven parts as a punishment for his unbecoming behaviour. But Kaladewila rising up from his seat, and lifting up his hands to his forehead, bowed respectfully to the infant Phralaong. The Prince, astonished at such wonderful condescension from so eminent a personage, followed his example, and out of respect prostrated himself before his son.

By virtue of his great spiritual attainments Kaladewila could recollect at once all that had taken place during the forty preceding worlds, and foresee all that would happen during the same number of future revolutions of nature. On seeing the high perfections shining forth in our Phralaong, he considered attentively whether he would become a Budha or not. Having ascertained that such a dignity was reserved for him, he wished to know if the remaining period of his existence, would permit him to witness the happy moment when he would be a Budha. To his deep regret, he foresaw that the end of his existence would come before the occurrence of that great event, and that he would have then migrated to one of the seats of Arupa, and be therefore deprived of the favor of hearing the law from his mouth. This foresight caused a profound sadness in his heart, and abundant tears flowed from his eyes. But when he reflected on the future destiny of the blessed child, he could not contain within himself the pure joy that overflowed his soul. The people present on the occasion soon remarked the opposite emotions which alternately affected the soul of Kaladewila. They asked him the reason of such an unusual occurrence. I rejoice, said he, at the glorious destiny of that child; but I feel sad and disconsolate on thinking that it will not be given to me to see and contemplate him, clothed with the dignity of Budha; I bewail in tears my great misfortune.

With the view of assuaging his sorrow, Kaladewila casting another glance toward future events, eagerly sought to discover if among his relatives, there would not be at least one who would be so fortunate as to see Phralaong in the nature of Budha. He saw with inexpressible delight that his nephew Nalaka would enjoy the blessing denied to himself. Thereupon he went in all haste to his sister's house, enquiring about her son. At his request, the lad was brought into his presence. Beloved nephew, said the venerable Rathe, thirty-five years hence,[33] the son of Prince Thoodandana will become a Budha, you will contemplate him in that sublime and exalted nature. From this day, therefore, you shall embrace the profession of Rahan. The young man who descended from a long succession of wealthy noblemen, said within himself, my uncle, truly, never says anything but under the impulse of irresistible and cogent motives. I will follow his advice and will become a Recluse. He immediately ordered the purchase of the insignia of his new profession, a Patta, a thingan[34] and other articles. His head was shaved and he put on the yellow garb. Attired in this new dress, he looked all round and saw that amongst all beings, the Rahans are by far the most excellent. Then turning towards the place Phraloong occupied, he prostrated himself five successive times in that direction, rose up, placed the Patta in its bag, threw it over his shoulder and directed his steps towards the solitude of Himawonta, where he devoted himself to all the exercises of his profession. At the time Phralaong became a Budha, our hermit went to that great master, learnt from him the works that lead to the state of perfect stability of mind, returned back to his solitude, and attained to the perfection of Rahanda by the practice of the eminent works.

Seven months after his return, the end of his existence arrived, when, disentangled from all the ties that had hitherto kept him in the world of passions, he reached the happy state of Niban.

CHAPTER 4TH.

Five days after the birth of Phralaong, took place the ceremony of washing the head and giving him a name. In the apartment of the palace, several kinds of perfumed wood and essences, such as sandal wood, lignum aloes, camphor, &c., were strewed profusely, as well as the most exquisitely scented flowers and parched rice. The Nogana (a sort of beverage made of milk, sugar and honey) was prepared in great abundance. One hundred and eighty Pounhas[35] the most versed in the Science of Astrology, were invited to partake of a splendid entertainment in the palace. The king made to every one of them costly presents and desired them to examine carefully all the signs, prognosticating the future destiny of his son. Amidst that crowd of Soothsayers, eight Pounhas had been present and explained the dream that Maia had in the beginning of her pregnancy. Seven of them lifting up the index[36] of each hand of the child, were amazed at the wonderful signs their eyes met. If this child, said they, remain in the society of men, he will become a mighty ruler that will bring all nations under his sway; but, if he embrace the profession of Recluse, he will certainly become a Budha. They began to foretell the incomparable glory and high honors that would attend his universal reign. The eighth Pounha, named Kauntagna, the descendant of the celebrated son of Thoodata, and the youngest of all, raised up the index of one hand only of the child. Struck with the wonderful and unmistakeable signs that forced themselves on his view, he exclaimed—no! this child will not remain long in the society of men, he will free himself from the vicissitudes[37] and miseries attending the existence of all beings, and will finally become a Budha. As the child was to be the instrument of promoting the welfare and merits of all mortals, they gave him the name of Theidat.

Seven days after her confinement, Maia died, and by the virtue of her merits she migrated to the seat of Toocita, and became a daughter of Nat. Her death was not the result of her delivery, but she departed this world, because the term of her life had come. On their return to their home, the Pounhas assembled their children and said to them:—We are already advanced in years. We dare not promise to ourselves that we will ever see the son of Prince Thoodandana become a Budha. But to you such a favor is reserved; listen respectfully to all his instructions and endeavour to enter the profession of Rahan without delay and withdraw into solitude, let us also all join you in that holy vocation. Three Pounhas, however, refused the invitation, and would not enter the profession. The five others cheerfully gave up everything and became distinguished members of the Ascetic life.

Prince Thoodandana hearing of the explanation given by the Pounhas, enquired whether his son was really to become a Rahan. Having been assured that all the signs predicted the future destiny of his son to such a calling, he desired to know what those signs were. He was told that the four following things were the very signs that indicated the future profession of his son, viz.:—an old man, a sick man, a dead man, and a Recluse.[38] His son having successively remarked those four signs would immediately come to the conclusion that the state of Rahan is alone worthy of the admiration and eager wishes of a wise man.

Prince Thoodandana who ardently wished to see his son become a great monarch, whose sway would extend over the four great islands and the two thousand smaller ones, gave the strictest orders that no one of the four omens should even meet his eyes. Guards were placed in every direction, at distances of a mile, charged with but one care, that of keeping out of his sight the appearance of those fatal omens.

On that day, eighty thousand noblemen, who were present at the great rejoicings, pledged themselves each one to give one of his male children to attend on the royal infant. If he become, said they, a mighty monarch let our sons be ever with him, as a guard of honor to confer additional lustre on his wonderful reign; if he be ever elevated to the sublime dignity of Budha, let our children enter the holy profession of Recluse and follow him whithersoever he may direct his steps.

Thoodandana with the tender solicitude of a vigilant father, procured for his beloved offspring nurses exempt from all corporal defects and remarkable for their beautiful and graceful appearance.

The child grew up surrounded with a brilliant retinue of numerous attendants.

On a certain day happened the joyful feast of the ploughing season. The whole country by the magnifience of the ornaments that decorated it, resembled one of the seats of Nats. The country people, without exception, wearing new dresses, went to the palace. One thousand ploughs and the same number of pairs of bullocks were prepared for the occasion. Eight hundred ploughs, less one, were to be handled and guided by noblemen. The ploughs, as well as the yokes and the horns of the bullocks, were coverd with silver leaves. But the one reserved for the monarch was covered with leaves of gold. Accompanied by a countless crowd of his people, Prince Thoodandana left the royal city and went into the middle of extensive fields. The royal infant was brought out by his nurses on this joyful occasion. A splendid jambu tree (Eugenia), loaded with thick and luxuriant green foliage, offered on that spot a refreshing place under the shade of its far extending branches. Here the bed of the child was deposited. A gilt ceiling was immediately raised above it, and curtains embroidered with gold ornaments were disposed round it. Guardians having been appointed to watch over the infant, the prince, attended by all his courtiers, directed his steps towards the place where all the ploughs were held in readiness. He instantly put his hands to his own plough; eight hundred noblemen, less one, and the country people followed his example. Pressing forward his bullocks, he ploughed to and fro through the extent of the fields. All the ploughmen emulating their royal lord, drove their ploughs in an uniform direction. The scene presented a most animated and stirring spectacle on an immense scale. The applauding multitude filled the air with cries of joy and exultation. The nurses who kept watch by the side of the infant's cradle, excited by the animated display, forgot the prince's orders and ran near to the spot to enjoy the soul stirring sight displayed before their admiring eyes. Phralaong casting a glance all round and seeing no one close by him, rose up instantly and sitting in a cross legged position remained absorbed, as it were in a profound meditation. The nurses busy in preparing the prince's meal, had spent more time than it was at first contemplated. The shadow of other trees, by the movement of the sun, had turned in an opposite direction. The nurses reminded by this sight that the infant had been left and that his couch was exposed to the rays of the sun hastened back to the spot they had so imprudently left. But great was their surprise, when they saw that the shadow of the jambu tree had not changed its position, and that the child was quietly sitting on his bed. The news of that wonder were immediately conveyed to Prince Thoodandana who came in all haste to witness it. He forthwith prostrated himself before his son, saying:—this is, beloved child, the second time that I bow to you.

Phralaong[39] having reached his sixteenth year, his father ordered three palaces to be built for each season of the year. Each palace had nine stories, and forty thousand maidens, skilful in playing all sorts of musical instruments, were in continual attendance upon him and charmed by uninterrupted dances and music all his moments. Phralaong appeared among them with the beauty and dignity of a Nat, surrounded with an immense retinue of daughters of Nats. According to the change of seasons he passed from one palace into another in the full enjoyment of all pleasures and amusements. The beautiful Yathaudara was his favorite wife.

Whilst Phralaong was spending his time in the midst of pleasures, his relatives complained to the king regarding the conduct of his son. They strongly remonstrated against his mode of living which precluded him from applying himself to the acquisition of those attainments befitting his exalted station. Sensible of those reproaches, Thoodandana sent for his son to whom he made known the complaints made against him by his relatives. Without showing any emotion, the young prince replied: let it be announced to the sound of the drum throughout the country that this day week I will show to my relatives in the presence of the best masters, that I am fully conversant with the eighteen sorts of arts and sciences. On the appointed day he displayed before them the extent of his knowledge—they were satisfied, and their doubts and anxieties on his account vanished away.

On a certain day Phralaong, desiring to go and enjoy amusement in his garden, ordered his coachman to have his conveyance ready for that purpose. Four horses richly caparisoned were put to a beautiful carriage that resembled the seat of a Nat. Phralaong having occupied his seat, the coachman drove rapidly towards the garden. The Nats who knew that the time was near at hand when Phralaong would become a Budha, resolved to place successively before his eyes, the four signs for showing his future high dignity. One of them assumed the form of an old man, the body bending forward, with grey hairs, a shrivelled skin and leaning languidly on a heavy staff. In that attire, he advanced slowly with trembling steps towards the prince's conveyance. He was seen and remarked only by Phralaong and his coachman. Who is that man, said the prince to his driver, the hairs of his head, indeed, do not resemble those of other men. Prince, answered the coachman, he is an old man, every born being is doomed to become like him, his appearance must undergo the greatest changes, the skin will shrivel, the hairs turn grey, the veins and arteries, losing their suppleness and elasticity, will become stiff and hardened, the flesh will gradually sink and almost disappear, leaving the bare bones covered with dry skin. What, said to himself the terrified prince, birth is indeed a great evil, ushering all beings into a wretched condition which must be inevitably attended with the disgusting infirmities of old age. His mind being taken up entirely with such considerations, he ordered his coachman to drive back to his palace. Thoodandana having enquired from his courtiers what motive had induced his son to return so soon from the place of amusement, was told that he had seen an old man and that he entertained the thought of turning Recluse. Alas! said he, they will succeed in thwarting the high destiny of my son. But let us try now every means to afford him some distraction so that he may forget the evil idea that has just started up in his mind. He gave order to bring to his son's palace the prettiest and most accomplished dancing girls, that in the midst of ever renewed pleasures, he might lose sight of the thought of ever entering the profession of Rahan. The guard surrounding his palace was doubled so as to preclude the possibility of his ever seeing the other signs.

On another day, Phralaong, on his way to his garden, met with the same Nat under the form of a sick man who appeared quite sinking under the weight of infirmity. Frightened at such a sight, Phralaong, hearing from the mouth of his faithful driver what this loathsome object was, returned in all haste to his palace. His father more and more disturbed at the news conveyed to him, multiplied the pleasures and enjoyments destined for his son, and doubled the number of guards that had to watch over him. On a third occasion whilst the prince was taking a walk, the same Nat, assuming the shape of a dead man, offered to the astonished regards of the prince the unpleasant sight of a corpse; trembling with fear the young prince came back forthwith to his residence. Thoodandana being informed of what had taken place, resorted to fresh precautions and extended to the distanee of one youdzana the immense line of countless guards set all round the palace.

On a fourth occasion, the prince driving rapidly towards his garden, was met on his way by the same Nat under the meek form of a Rahan. The curiosity of the prince was awakened by the extraordinary sight of that new personage; he asked his coachman what he was. Prince, answered the coachman, he is a Rahan. At the same time, though little acquainted with the high dignity and sublime qualifications of a Recluse, he was enabled, by the power of the Nats, to praise and extol in dignified language the profession and merits of a Rahan. The prince felt instantaneously an almost irresistible inclination to embrace that attractive mode of life. He quietly went on his way as far as his garden.

The whole day was spent in all sorts of rural diversions. Having bathed in a magnificent tank, he went a little before sun-set to rest awhile on a large well polished stone table, overshaded by the far-spread branches of beautiful trees, hanging above it, waiting for his richest dress. All his attendants were busily engaged in preparing his finest clothes and most elegant ornaments. When all was ready, they stood silent round him waiting for his orders. Perfumes of every description were disposed in circular row, with the various ornaments, on the table, whereon the Prince was sitting.

At that very moment a chief Thakia was quietly enjoying a delicious and refreshing rest on the famous stone table called Pantoo Kambaba. On a sudden, he felt his seat, as it were, getting hot. Lo! what does this mean? said the astonished Thakia, am I doomed to lose my happy state? Having recollected himself and reflected a while on the cause of such a wonderful occurence, he soon knew that Phralaong was preparing to put on for the last time his princely dress. He called to him a son of Nat named Withakioon, and said to him:—on this day at midnight Prince Theiddat is to leave his palace and withdraw into solitude; now he is in his garden preparing to put on his richest attire for the last time: go, therefore, without a moment's delay to the place where he is sitting, surrounded by his attendants, and perform to him all the required services. Bowing respectfully to the chief of Thakias, Withakioon obeyed and by the power inherent in the nature of Nats, he was in an instant carried to the presence of Phralaong. He assumed the figure of his barber and immediately set to work by arranging the turban, with as much taste as art, round his head. Phralaong soon found out that the skilful hand which disposed the folds of his head-dress, was not that of a man but of a Nat. One fold of the turban appeared like one thousand, and ten folds like ten thousand folds, offering the magical *coup-d'œil* of as many different pieces of cloth, arranged with the most consummate skill. The extremity of the turban, which crossed vertically the whole breadth of the countless folds, appeared covered with a profusion of the most shining rubies. The head of Phralaong was small, but the folds of the turban seemed numberless. How could that be so? It is a wonder surpassing our understanding: it would be rashness and temerity to allow our mind to dwell too much upon it. Having completed his dress, Phralaong[40] found himself surrounded by all sorts of musicians, singers, and dancers, vieing with each other in increasing the rejoicings. The Pounhas sung aloud his praises. May he conquer and triumph; may his wishes and desires be ever fulfilled. The multitude repeated incessantly in his honor stanzas of praises and blessings. In the midst of universal rejoicings Phralaong ascended his carriage. He had scarcely seated himself when a message sent by his father, conveyed to him the intelligence that Yathaudra had been delivered of a son. That child, replied he with great coolness, is a new and strong tie I will have to break. The answer having been brought to his father, Thoodandana could not understand its meaning. He however caused his grandson to be named Raoula. Phralaong sitting on his carriage, surrounded by crowds of people who rent the air with cries of joy and jubilation, entered into the city of Kapilawot. At that moment a Princess named Keissa Gautami, was contemplating from her apartments the triumphant entrance of Phralaong into the city. She admired the noble and graceful deportment of Prince Theiddat and exclaimed with feelings of inexpressible delight:—happy the father and mother who have such an incomparable son: happy the wife who is blest which such an accomplished husband. On hearing those words, Phralaong desired to understand their meaning and know their bearing. By what means, said he to himself, can a heart find peace and happiness. As his heart was already disentangled from the thraldom of passions, he readily perceived that real happiness could be found but in the extinction of concupiscence, pride, ignorance, and other passions. He resolved henceforth to search ardently the happy state of Niban, by quitting on this very night the world, leaving the society of men, and withdrawing into solitude. Detaching from his neck a collar of pearls of an immense value, he sent it to Keissa Gautami, as a token of gratitude for the excellent lesson she had given him by the words she had uttered in his praise. The young princess received it as a mark of favor she imagined Prince Theiddat intended to pay her. Without further notice of her, he retired into his own apartment to enjoy some rest.

CHAPTER 5TH.

Phralaong had scarcely began to recline on his couch when a crowd of young damsels, whose beauty equalled that of the daughters of Nats, executed all sorts of dances to the sound of the most ravishing symphony, and displayed in all their movements the graceful forms of their elegant and well-shaped persons in order to make some impression upon his heart. But all was in vain: they were foiled in their repeated attempts. Phralaong fell into a deep sleep. The damsels perceiving their disappointment, ceased their dances, laid aside their musical instruments, and soon following the example of Phralaong abandoned themselves to the soporific inclination caused by their useless and harassing exertions. The lamps lighted with fragrant oil, continued to shed their brilliant light throughout the apartments. Phralaong awoke a little before midnight and sat in a cross-legged position on his couch. Looking all round him, he saw the varied attitudes and uninviting appearance of the sleeping damsels. Some were snoring, others gnashing their teeth, others opened wide mouths, others tossed heavily from the right to the left side, some stretched one arm upwards and the other downwards, some seized, as it were, with a frantic pang, suddenly coiled up their legs for a while, and with the same violent action pushed them down again. This unexpected exhibition made a strong impression on Phralaong; his heart was set, if possible, freer from the ties of concupiscence or rather was confirmed in his contempt for all wordly pleasures. It appeared to him that his magnificent apartment were filled with the most loathsome and putrid carcasses. The seats of passions, those of Rupa, and those of Arupa, that is to say the whole world, seemed to his eyes like a house that is a prey to the devouring flames. All that is most disgusting and despicable, said he to himself. At the same time his ardent desires for the profession of Rahan, were increasing with an uncontrolable energy. On this day at this very moment, said he with an unshaken firmness, I will retire into a solitary place. He rose instantly and went to the arched door of his apartment. Who is here asleep, said he to the first person he met. Your servant, replied instantly the vigilant noble Tsanda. Rise up quickly, replied the prince, now I am ready to retire from the world and resort to some lonely place, go to the stable and prepare the fastest of my horses. Tsanda bowed respectfully to his master and executed his orders with the utmost celerity. The horse Kantika knowing the intentions of the prince, felt an inexpressible joy at being selected for such a good errand, he testified his joy by loud neighs but by the power of the Nats the sound of his voice was silenced so that none heard it.

Whilst Tsanda, in compliance with the orders he had received, was making the necessary preparations, Phralaong desired to see his newly born son Raoula. He opened gently the door of the room where the princess was sleeping, having one hand placed over the head of the infant. Phralaong stopping at the threshold, said to himself:—if I go farther to contemplate the child, I will have to remove the hand of the mother, she may be awakened by this movement, and then she will prove a great obstacle to my departure. I will see the child after having become a Budha. He instantly shut the door and left the palace. His charger was waiting for him. To your swiftness, said Phralaong to Kantika, do I trust for executing my great design. I must become a Budha, and labor for the deliverance of men and Nats from the miseries of existence and lead them safely to the peaceful shores of Niban. In a moment he was on the back of his favorite horse. Kantika was a magnificent animal; his body measured eighteen cubits in length, its height and circumference were in perfect proportion to its length. The hair was of a beautiful white resembling a newly cleaned shell; his swiftness was unrivalled and his neighings could be heard at a very great distance, but on this occasion the Nats interfered, no sound of his voice was heard, and the noise of his steps was completely silenced. Having reached the gate of the city, Phralaong stopped for awhile, uncertain as regards the course he was to follow. To open the gate which a thousand men could but with difficulty make to turn upon its hinges, was deemed an impossibility. Whilst he was deliberating with his faithful attendant Tsanda, the huge gate was silently opened by the Nats, and free passage given to him through it.

Phralaong had scarcely crossed the threshold of the gate, when the tempter endeavoured to thwart his pious designs. Mara[41] Nat resolved to prevent him from retiring into solitude and becoming a Budha. Standing in the air, he cried aloud:—Prince Theiddat, do not attempt to lead the life of a Recluse; seven days hence, you will become a Tsekiawade, your sway shall extend over the four great islands; return forthwith to your palace. Who are you, replied Phralaong. I am Mara Nat, cried the voice. I know, said Phralaong, that I can become a Tsekiawade, but I feel not the least inclination for dignity, my aim is to arrive at the nature of Budha. The tempter, pushed onward by his three wicked propensities, concupiscence, ignorance and anger, did not part for a moment from Phralaong, but as the shadow that always accompanies the body, he from that day, followed always Phralaong, striving to throw every obstacle in his way towards the dignity of Budha.. Trampling down every human and worldly consideration, and despising a power full of vanity and illusion, Phralaong left the city of Kapilawot, at the full moon of July under the constellation Oottarathan. A little while after he felt a strong desire of turning back his head and casting a last glance over the magnificent city he was leaving behind him; but he soon overcame that inordinate desire and denied to himself this gratification. It is said, that on the very instant he was combating the rising sense of curiosity, the mighty earth turned with a great velocity, like a potter's wheel, so that the very object he denied himself the satisfaction of contemplating, came under his very eyes. Phralaong hesitated awhile as to the direction he was to follow, but he resolved instantly to push on straitforward.

His progress through the country resembled a splendid triumphal ovation. Sixty thousand Nats marched in front of him, an equal number followed him, and as many surrounded him on his right and on his left. All of them carried lighted torches, pouring a flood of light in every direction, others again spread perfumes and flowers brought from their own seats. All joined in chorus singing the praises of Phralaong. The sound of their united voices resembled the loud peals of continued thunder, and the resounding of the mighty waves at the foot of the mount Oogando. Flowers shedding the most fragrant odour were seen gracefully undulating in the air like an immense canopy, extending to the farthest limits of the horizon. During that night Phralaong attended with this brilliant retinue, travelled a distance of thirty youdzanas, and arrived on the banks of the river Anauma. Turning his face towards Tsanda, he asked what was the river's name. Anauma is its name, replied his faithful attendant. I will not, said Phralaong to himself, show myself unworthy of the high dignity I aspire to. Spurring his horse, the fierce animal leaped at once to the opposite shore. Phralaong alighted on the bank, covered with a fine sand resembling pearls when the rays of the sun fell upon it in the morning. On this spot he divested himself of his dress and calling Tsanda to him, he directed him to take charge of his ornaments and carry them back with the horse Kantika to his palace. For himself, he had made up his mind to become a Rahan. Your servant too, replied Tsanda, will become also a Recluse in your company. No, said the prince, the profession of Rahan does not at present befit you. He reiterated this prohibition three times. When he was handing over to him his ornaments he said to himself:—these long hairs that cover my head, and my beard too, are superfluities unbecoming the profession of Rahan. Whereupon, with one hand unsheathing his sword and with the other seizing his comely hairs, he cut them with a single stroke. What remained of his hairs on the head, measured about one inch and half in length. In like manner he disposed of his beard. From that time he never needed shaving—the hairs of his beard and head never grew longer during the remainder of his life.[42] Holding his hairs and turban together he cried aloud:—if I am destined to become a Budha, let these hairs and turban remain suspended in the air; if not let them drop down on the ground. Throwing up both at the height of one youdzana, they remained suspended in the air until a Nat came with a rich basket, put them therein, and carried them to the seat of Tawadeintha, where he erected the Dzedi Dzoulamani wherein they were religiously deposited. Casting his regards on his own person, Phralaong saw that his rich and brilliant robe did not answer his purpose, nor appeared befitting the poor and humble profession he was about to embrace. Whilst his attention was taken up with this consideration, a great Brahma named Gatigara, who in the days of the Budha Kathaba had been intimate friend of our Phralaong, and who during the period that elapsed between the manifestation of that Budha to the present time, had not grown old, discovered at once the perplexity of his friend's mind. Prince Theiddat, said he, is preparing to become a Rahan, he is not supplied with the dress and other implements essentially required for his future condition. I will provide him now with the Thinbaing, the Kowot, the Dugout, the Patta, the Leathern Girdle, the hatchet, the needle and filter.[43] He took with him all these articles and in an instant arrived in the presence of Phralaong to whom he presented them. Though unacquainted with the details of that dress and untrained to the use of those new implements, the prince, like a man who had been a Recluse during several existences, put on with a graceful gravity his new dress. He adjusted the Thinbaing round his waist, covered his body with the Kowot, threw the dugout over his shoulders, and suspended to his neck the bag containing the earthen patta. Assuming the grave, meek and dignified countenance of a Rahan, he called Tsanda and bade him to go back to his father and relate to him all that he had seen. Tsanda complying with his master's request, prostrated himself three times before him, then rising up, he wheeled to the right and departed. The spirited horse hearing the last words of Phralaong, could no more control his grief.[44] Alas! said he, I will see no more my master in this world. His sorrow grew so great that his heart split into two parts, and he died on the spot. After his death, he became a Nat in the seat of Tawadeintha. The affliction of Tsanda, at parting with his good master, was increased by the death of Kantika. The tears that streamed down his cheeks resembled drops of liquid silver.

CHAPTER 6TH.

Phralaong having thus began the life of a Recluse, spent seven days alone in a forest of mango trees, enjoying in that retirement the peace and happiness of soul which solitude alone can confer. He then started for the country of Radzagio, travelling on foot a distance of thirty youdzanas. Arrived near the gate of the royal city, Phralaong stopped for a while, saying within himself:—Peipathari, the king of this country will no doubt hear of my arrival at this place. Knowing that the son of prince Thoodandana is actually in his own royal city, he will insist upon my accepting all sorts of presents. But now in my capacity of Rahan, I must decline accepting them, and by the rules of my profession I am bound to go and beg along the streets from house to house, the food necessary for my support. He instantly resumed his journey, entered the city through the eastern gate, the Patta hanging on his left side and followed the first row of houses, receiving the alms which pious hands offered him. At the moment of his arrival the whole city was shaken by a mighty commotion, like that which is felt in the seat of Thoora when the Nat Athoorein makes his apparition into it. The inhabitants, terrified at such an ominous sign, ran in all haste to the palace. Admitted into the presence of the monarch, they told him that they knew not what sort of being had just arrived in the city, walking through the streets and begging alms. They could not ascertain whether he was a Nat, a man or a Galong. The king, looking from his apartments over the city, saw Phralaong, whose meek deportment removed all anxiety from his mind. He however directed a few of his noblemen to go and watch attentively all the movements of the stranger. If he be, said he, a Bilou, he will soon leave the city and vanish away; if a Nat, he will raise himself in the air, if a Naga, he will plunge to the bottom of the earth. Phralaong having obtained the quantity of rice, vegetables, &c. he thought sufficient for his meal, left the city through the same gate by which he had entered it, sat down at the foot ef a small hill, his face turned towards the east, and tried to make his meal with the things he had received. He could not swallow the first mouthful which he threw out of his mouth in utter disgust. Accustomed to live sumptuously and feed on the most delicate things, his eyes could not bear even the sight of that loathsome mixture of the coarsest articles of food collected at the bottom of his Patta. He soon, however, recovered from that shock and gathered fresh strength to subdue the opposition of nature, overcome its repugnance, and conquer its resistance. Reproaching himself for such an unbecoming weakness:—was I not aware, said he, with a feeling of indignation against himself, that when I took up the dress of a Recluse such would be my food. The moment is come to trample over nature's appetites. Whereupon he took up his Patta, ate cheerfully his meal, and never after did he ever feel any repugnance for what things soever he had to eat.

The king's messengers having closely watched and attentively observed all that had happened, returned to their master to whom they related all the particulars they had witnessed. Let my carriage be ready, said the king, and do you follow me to the place where this stranger is resting. He soon perceived Phralaong at a distance, sitting quietly after his refection. Peipathari alighted from his conveyance, respectfully drew near to Phralaong and having occupied a seat in a becoming place, he was overwhelmed with contentment and inexpressible joy, to such an extent, indeed, that he could scarcely find words to give utterance to his feelings. Having at last recovered from the first impression, he addressed Phralaong in the following manner: Venerable Recluse, you seem to be very young still and in the prime of your life, in your person you are gifted with the most attractive and noble qualities indicating surely your illustrious and royal extraction. I have under my control and in my possession a countless crowd of officers, elephants, horses, and chariots, affording every desirable convenience for pleasure and amusement of every description. Please to accept of a numerous retinue of attendants with whom you may enjoy yourself whilst remaining within my dominions. May I be allowed to ask what country you belong to, who you are, and from what illustrious lineage and descent are you come. Phralaong said to himself:—it is evident that the king is unacquainted with both my name and origin, I will however satisfy him on the subject of his enquiry. Pointing out with his hand in the direction of the place he had come from, he said:—I arrive from the country which has been governed by a long succession of the descendants of Prince Kothala, I have indeed been born from royal progenitors, but I have abandoned all the prerogatives attached to my position, and entered the profession of Rahan. From my heart I have rooted up concupiscence, covetousness and all affections to the things of this world. To this the king replied:—I have heard that Prince Theiddat, son of king Thoodadana had seen four great signs, portending his future destiny for the profession of Recluse, which would be but a step to lead him to the exalted dignity of Budha. The first part of the passage has been already fulfilled. When the second shall have received its accomplishment, I beg you will show your benevolence to me and my people—I hope my kingdom will the first country you will direct your steps to after having acquired the supreme knowledge. To this Phralaong graciously assented.

NOTES.

28. According to Budhistic notions, Budha labors during his mortal career for the benefit of all living beings. His benevolent and compassionate heart, free from all partiality, feels an ardent desire of opening before them the way that leads to the deliverance from the miseries of ever succeeding existences, and bringing them finally to the never troubled state of Niban. The Brahmas inhabiting the sixteen seats of Rupa, are all but ripe for obtaining the crowning point of Budhistic perfection. They wait but for the presence of a Budha to unloose by his preachings the slender ties that keep them still connected with this material world. The Nats, though far less advanced in merits and perfection, eagerly look forward for the apparition of that great personage, who is to point out to them the means of freeing themselves from the influence of passions, and thereby destroying in them the principle of demerits. Men also in their state of probation and trial, want the mighty aid of a Budha, who will enable them by his transcendent doctrine to advance in merits, for either arriving at once to the ever quiescent state of Niban,

or progressing in the way of merits. Hence, on his birth, Budha is ministered to by those three sorts of intelligent beings who are particularly destined to share in the blessings his coming is designed to shower on them.

29. The Chinese, Cochin-Chinese, Singalese and Nepaulese Legends all agree in attributing to Phralaong the use of reason from the moment he was born, as well as the power of uttering with a proud accent the following words:—I am the greatest of all beings, this is my last existence. To his own eyes he must have appeared in this world without any competitor, since he knew already that he was destined to release countless beings from the trammels of existence, and lead them to a state of perfect rest, screened for ever from the incessant action of merits and demerits. He alone whose mind is deeply imbued with Budhistic notions, can boast exultingly that at last he has arrived at his last existence, and that within a few years he will escape out of the sad whirlpool of endless existences, wherein he has been turning, fluctuating from a state of happiness to one of wretchedness. This perpetual vicissitude is to him the greatest evil, the opposite of which is, therefore, the greatest good. No wonder, thus, to hear our Phralaong, who was better acquainted with the miseries attending existence than any one else, exclaiming with the accents of complete joy :—this is my last existence.

The Burmese Translator very properly remarks that on two former occasions, Phralaong, then an infant, had spoken distinct words which he addressed to his mother. This happened in the beginning of two existences during which he practised two of the ten great virtues. The first wonder happened on the day he was born to that existence, when under the name of Mahauthata, he displayed consummate skill and wisdom. The legend of Mahauthata is a very amusing performance, written in a very pure language, and relating stories about as credible as those we read in the Arabian Tales of A Thousand and One Nights. What surprised the writer not a little was his finding on perusing that composition, a decision given by our Mahauthata in a case perfectly similar to that which showed out, in the presence of all Israel, the incomparable wisdom of Solomon. When Phralaong practised the last and most perfect of virtues, liberality, carried to its farthest limits, ending in perfect abnegation of self, and renouncing all that he possessed, he entered into this world with the faculty of speech, and become a Prince under the name of Wathandra. The legend of Wathandra is by far the best of all. Taking it as a mere Romance it is replete with circumstantial details well calculated to excite the finest emotions of the heart. The latter part, in particular, can scarcely be read without sharing in the most heart-moving feelings of pity and commiseration, on beholding our Phralaong parting willingly with all his property, with his wife and his two lovely children, and finally offering his own person to satisfy the ever renewed calls on his unbounded generosity.

30. The description or enumeration of the royal insignia includes the white umbrella, which, with the Burmese, is the distinctive mark of royalty. Hence the common expressions frequently met with in their writings, to receive, or to succeed to the white umbrella, to designate the succession to the throne.

31. In glancing over the genealogy of the twenty-eight last Budhas, the writer has observed that every Budha has always obtained the supreme intelligence under the shadow of some trees. Our Phralaong, as will be seen hereafter, attained to the exalted dignity of Budha, under the tree Baudhi, (*ficus religiosa*,) which grew up spontaneously at the same moment he was born. The writer has never been able to discover any well-grounded reason to account for this remarkable circumstance, so carefully noted down in relating the particulars attending the elevation of a Being to this high station. For want of a better one he will be permitted to hazard the following conjecture:—Our Phralaong previous to his becoming a Budha, withdrew into solitude for the purpose of fitting himself for his future calling, in imitation of all his predecessors, leading an ascetic life, and devoting all his undivided attention and mental energies to meditation and contemplation, coupled with works of the most rigorous mortification. The senses, he knew well, were to be submitted to the uncontrolled sway of reason, by allowing to himself but what was barely requisite for supporting nature. Regardless of every personal comfort, his mind was bent upon acquiring the sublime knowledge of the principle and origin of all things, in fathoming the miseries of all beings, and endeavoring to discover the most efficacious means of affording them a thorough relief, by pointing out to them the road they had to follow in order to disentangle themselves from the trammels of existence and arriving at a state of perfect rest. In common with all other ascetics, our Phralaong had no other shelter against the inclemency of the seasons, but the protecting shadow of trees. It

was under the cooling and refreshing foliage of the trees of the forests, that he spent his time in the placid and undisturbed work of meditation, acquiring gradually that matchless knowledge and consummate wisdom he needed for carrying on to perfection the benevolent undertaking he had in contemplation.

32. It is a maxim generally received among Budhists, that he who has far advanced in the way of perfection, acquires extraordinary privileges both in his soul and in his body. The latter obtains a sort of spiritualized nature, or rather matter becomes so refined and purified, that it is enabled to travel distances with almost the rapidity of the thought of the mind. The former, by the help of continual meditation over the causes and nature of all things, aggrandizes incessantly its sphere of knowledge. The remembrance of the past revives in the mind. From the lofty position such a Being is placed in, he calmly considers and watches the movement of events that will take place in future times. He is not. like Budha, himself possessed of the Supreme intelligence, because he is less than he advanced in perfection, but the greater his progress towards the summit of perfection, the more extensive becomes his knowledge of things.

33. According to the prophecy of Kaludewila, Phralaong is to become Budha when thirty-five years old. The total duration of his life being eighty years, it follows that he has lived as Budha forty-five years. The advice of the old Rathe to his nephew Nalaka to become a Rahan for better disposing himself to welcome the coming of Budha, and listen with greater benefit to his preachings, leads me to make a remark and write down an observation that has often occurred to my mind. From this passage and many others which the reader will easily notice hereafter, as well as from the example of Budha himself, one must suppose that at the time Phralaong was born, Budhistic institutions, at least the most important one, viz. that of the Rahans, Recluses or Monks, already existed in a more or less perfect state. Relying solely on the authority of this Legend, no attempt at denying this supposition can ever be made. Kaludewila speaks of the order of Rahans as of a thing well known. Nalaka sends to the bazar for the purchase of the dress and other articles he wanted for his new mode of life. Phralaong on his way to his garden sees a Rahan, whose habits and manners are described to him by his coachman. Having become Budha he meets with Ascetics and Recluses living in community, leading a life much resembling that which he is supposed to have hereafter instituted, holding but few opinions which according to his own standard were heretical. From these facts flows the natural conclusion that Gaudama is not the inventor or originator of the Budhistic system, but at the utmost he may be considered as a reformer and remodeller of doctrines and practices already existing, and certainly an ardent promoter of the reform he endeavored to introduce. Should the conclusion that has been arrived at, on the mere authority of the present work, be ever proved erroneous by monuments or writings of a greater weight and importance, it must be inferred that our Legend, purporting to give an account of the life and preachings of the last Budha, has been fabricated and made up of incongruous elements collected here and there for suiting the purposes of ambition and superstition. It affords no data from which events might be arranged in a chronological order, except barely mentioning the names of certain personages, whose existence, country and principal actions are related in other writings, the authenticity of which is perhaps as questionable as that of our Legend. The *rôle* ascribed to Budha is that of a benevolent, kind, merciful and compassionate being, who having fathomed the depths of human wretchedness and misery, and examined carefully the principles that had led men into error, devotes himself to the laborious and difficult task of affording effectual relief to mankind, bringing them back into the right way which they had forsaken, and finally leading them to a state of perfect quiescence. In a word he is made to play the part of a Saviour. There are, moreover, many incidents in the life of Budha which bear a striking affinity with many particulars attributed by the sacred penmen to our Saviour. These mere suggestions may have a great weight on the mind of many, to induce them to believe that the present work has been made up from vague and incorrect notions of Christianity that at an early period have certainly found their way in those countries where it was already subsisting, but in a state on which we can form no accurate opinion. In placing before the eyes of the readers this supposition, my sole object is to show the possibility, if not the probability of the Legend having been composed with the accession of elements foreign to Budhism. But it ought not to be inferred therefrom, that the essential doctrines of Budhism have been borrowed from the same source, as it is, as far as researches on this subject go, certain that the philosophical school from which they have likely originated and emanated was in existence previous to our era.

34. The Thingan or Tsiwaran is composed of three parts,—the thinbaing resembling an ample petticoat, bound up to the waist with a leathern girdle, and falling down to the heels; the kowat, which consists of a sort of cloak of a rectangular shape, covering the shoulders and breast, and reaching somewhat below the knee; and the dugout, which is a piece of cloth of the same shape, folded many times, thrown over the left shoulder when abroad, and used to sit on, when no proper seat has been prepared. The color of these three pieces constituting the dress of a Recluse is invariably yellow. The jack tree supplies the materials for dyeing the cloth yellow. In order to maintain a spirit of perfect poverty among the members of the order of Recluses, the Wini prescribes that the Tsiwaran ought to be made up with rags picked up here and there and sewed together. The rule in this respect, at least as far as its spirit goes, is thoroughly disregarded and become almost a dead better.

The hairs of the head and the beard being too often objects which vanity turns to its own purposes are to say the least mere superfluities, a stern contemner of worldly things must of course do away with things which may prove temptations to him, or at least afford him unnecessary trouble. Hence no layman can ever aspire to become a Rahan, unless he has submitted to the operation of a complete shaving of the head, including even the eye-brows.

35. Which of the two systems, Budhism or Brahminism, is the most ancient? This is a question which learned Orientalists have answered very differently, and perhaps up to this time we may say with the Latin Poet, *adhuc sub judice lis est*. If, however, some credit is to be given to this Legend, and the hero thereof is to be regarded as the author of Budhism, the solution of that much controverted question is comparatively easy and seems to admit of no doubt. Priority of antiquity is decidedly in favor of Brahminism. At the time Budha was born, and in his own country, we find already subsisting the great politico-religious fabric of Hinduism. The distinction of castes is clearly mentioned in several passages. We find the Pounhas or Brahmins already monopolizing the lucrative trade of soothsaying, and regarded as the best informed among their countrymen. They are treated with great respect and consideration even by proud monarchs, who testify their regard to them by costly presents, and every possible mark of distinction. It is true that their caste is not always spoken of with great regard by Budhist authors, but this is to be attributed to the deadly enmity that has from the earliest period prevailed between those two great rival sects that have so long struggled for supremacy over the Indian Peninsula. The Brahminical creed is spoken of in very disparaging terms by Budhists, and as a matter of course, they have been reciprocally handled severely by their opponents. To those who feel inclined to regard Budha as but a great reformer of a religious system already existing, the question will not appear cleared of all difficulty. But upon them rests the task of establishing on uncontrovertible grounds their hypothesis, ere any serious attention can be paid to the conclusion they would fain infer in favor of the superior antiquity of Budhism.

36. Superstition and ignorance seem to have been in all ages and under every climate, the prolific source of human follies and mental delusions. Man has always been and will ever be the same ridiculously superstitious being, as long as his mind is left to itself, unenlightened by revelation. There is in him an innate desire of tearing into pieces the thick veil that hides from him the knowledge of future events. Unable to comprehend the perfect economy of an Allwise Providence, in the disposition and management of the affairs of this world, he has recourse to the most absurd means for satiating the cravings of his foolish curiosity. Hence the prevailing superstition of those days, which induced men to believe that Brahmins on inspecting the inner part of the hand could discover certain signs foreshowing the good or bad destiny of every individual.

37. Metempsychosis or the transmigration of the soul from one state of existence into another in the same world, is one of the leading dogmas of Budhism. Many passages of the present work, or rather the whole of the Budhistic system, can never be understood, unless this tenet be always borne in mind. It is by passing through countless existences, that a being is slowly purified of his imperfections and gradually advances in the way of merits and perfection. The sacred writings of Budhists mention that our Phralaong had to range during innumerable existences, the whole series of animals from the dove to the elephant, ere he could be born in the state of man. Pythagoras had likely borrowed and received directly and indirectly from the East, this doctrine which his school re-echoed throughout Greece and Italy. The end of Metempsychosis is, according to Budhists, the state

of Niban. On this point the author of Budhism has been at variance with other religious schools, which in his own days and subsequently have admitted and professed the dogma of transmigration. One of the most universally received opinions on this subject is that transmigration ends in a sort of absorption into the nature and essence of the Deity. Our Budha, flatly rejecting the idea of a Supreme Being, was compelled to devise some other state, which would be the final end of every perfected being.

38. The three first allegorical omens or signs which, according to the foretelling of the Pounhas, were to be seen and observed hereafter by Phralaong, are designed to mean and express the compound of all miseries attending human existence, from the moment man crosses the threshold of life to that of death. The view of these objects was intended to make him disgusted with a state necessarily accompanied with such an amount of wretchedness He was soon induced by reflection to hold in contempt the things of this world, and, consequently to seek with ardor some means of estranging himself from all visible and material objects. The fourth sign, that is to say the view of a Rahan, of a contemner of this world, aspiring to the perfect disengagement from the trammel of passions, and shaping his course towards Niban, was the very pattern he had to imitate and follow for arriving to that state of perfection, he felt a strong, though somewhat as yet confused desire of possessing.

39. From what has been hitherto mentioned of the life of our Phralaong, we may see that many particulars regarding his birth and his childhood have been described with sufficient accuracy, but little or nothing is said of his adolescence, at least until the age of sixteen, when he gets united to the famous and youthful Youthandra. In common with many other great men, this celebrated personage, if he ever existed, has almost all the years of his private life wrapped up in a complete obscurity. We may conclude from his great proficiency in the knowledge of those sciences and attainments befitting his high situation, he was not remiss, since he was enabled to set at defiance the greatest masters of those days. In the midst of pleasures, he knew to devote the best part of his time to study, unless we suppose science was infused into his mind by no exertion of his own. The Burmese have a regular mania for dividing with a mathematical precision, what at first appears to admit of no such division. Virtues, vices, sciences, arts, &c. all in a word is subjected to a rigorous division, which, if arbitrary in itself, has the great advantage of conferring a great help to memory.

40. The triumphal return of Phralaong from his garden to the city, where he is attired with the richest dress, is commemorated by Budhists, at least in Burmah, on the day a young boy is preparing to enter into a monastery of Recluses, for the purpose of putting on the yellow robe, and preparing himself for becoming afterwards a member of the order, if he feel an inclination to enlist among its members. Phralaong was bidding a last farewell to the world, its pomps and vanities. So is doing the youthful candidate, who is led processionally through the streets riding a richly caparisoned horse, or sitting on an elegant palankeen, carried on the shoulders of men. A description of this ceremony may be found in the remarks on the Budhistic Monks or Talapoins, published in two former numbers of this Journal.

I am obliged to confess that I have been at loss to discover any connexion between the expressions made use of by Keissa Gautami, and the conclusion drawn therefrom by Phralaong. We may suppose that the Burmese translator has left out something in the Pali text, or that the copiest has been guilty of some omission. Prince Thoodandana, influenced by worldly considerations, eagerly wished his son becoming a great monarch, instead of a poor and humble Recluse, even a Budha. This alone suggests the idea that in those days the role of a Budha was not held in so great an esteem and veneration, as it has been afterwards. Had it been otherwise the most ambitious father might have remained well satisfied with the certainty of seeing his very son becoming a personage, before whom the proudest monarchs would not have hesitated to lower to the dust their crowned heads. Again we see the Pounhas joining in chorus the surrounding multitude, praising the future Budha. How could this conduct be reconciled with the well known antipathy and opposition they ever showed to him from the beginning? One would be tempted to believe that the compiler of the Legend aimed at praising his hero, preferably to paying a strict and impartial regard to truth.

The means resorted to by Thoodandana, for retaining his son in the world of passions, and thereby thwarting his vocation, could not, we hardly need to mention, be approved of by any moralists of even the greatest elasticity of conscience and principles; but they were eminently fitted to try the soundness of Phralaong's calling, the strong and tenacious dispositions of his energetic mind. They set out in vivid colors the firmness of purpose and irresistible determination of his soul in following up his vocation to a holier mode of life; and what is yet more wonderful, the very objects that were designed to enslave him, become the instruments which helped him in gaining and ascertaining his liberty. Magnificent is indeed the spectacle, offered by a young Prince remaining unmoved in the midst of the most captivating soul-stirring, and heart-melting attractions, sitting coolly in his court and looking with indifference, nay with disgust, on the crowd of sleeping nymphs.

41. Phralaong having overcome with uncommon fortitude, the numberless obstables which he had encountered from the part of men, will have now to meet another foe, perhaps more formidable, a wicked Nat or Demon. His name, according to its orthography, is Mar or Mara, but the Burmese call him Man, which means pride. Mar is, therefore, the evil spirit of pride, or rather personified pride, and the enemy of mankind, ever ready to oppose the benevolent designs and generous efforts of Budha in carrying on his great undertaking, calculated to benefit humanity, by teaching men the way that leads to the deliverance from all miseries. The first plan concocted by Mar for stopping at the very onset the progress of Phralaong, is to flatter ambition by promising him *all the kingdoms of this world and their glory*. From that day, the tempter never lost sight of the benevolent Budha, but followed him everywhere, endeavoring to prevent the immense success that was to attend his future mission. The three evil propensities which constitute, as at were, the very essence of Mar's nature, are concupiscence, envy, and an irresistible proneness to do harm. The devil, indeed, could hardly be made up of worse materials.

That the reader may be made more sensible of the magnificent promise held out to Phralaong, if he gave up his plan of turning an ascetic, it will not be found out of place to sketch, in a few words, the world such as is imagined by Budhists. A world is composed of a huge central mount called Mimmo, measuring in height above the superficies of the earth 82,000 youdzanas, and the same depth below round its basis, but in the direction of the four cardinal points of the compass, are ranged the four great islands, differing in shape, color and appearance. We inhabit the southern one, called Dzapoodibha, from the jambu (*Eugenia*) tree growing upon it. Each of those islands is surrounded by five hundred smaller ones. The earthly portion of the globe is supported on an immense mass of water, which in its turn lies on the air. Beneath the air is saha or vacuum.

42. This circumstance explains one peculiarity observable in all the statues representing Budha. The head is invariably covered with sharp points, resembling those thorns with which the thick envelope of the durian fruit is armed. Often I had inquired as to the motive that induced native sculptors to leave on the head of all statues, these sorts of inverted nails, without ever being able to obtain any satisfactory answer. It was only after having read this passage of the life of Budha, that I was enabled to account for this apparently singular custom, which is designed to remind all Budhists of the ever continued wonder whereby the hairs which remained on Budha's head, never grew longer from the day he cut them with his sword.

43. Every Talapoin or Recluse must be provided with one needle, wherewith he is to sew his dress, one hatchet to cut the wood he may be in need of either for erecting a shelter for himself or for other purposes, and one filter to strain the water he intends to drink, that it should be cleared from all impurities, but chiefly of insects or any living body that might be in it, which would expose the drinker thereof to the enormous sin of causing the death of some animal.

44. The various accounts that are given of the horse Kantika, and the grief he feels at parting with his master, grief which reaches so far as to cause his death, may appear somewhat extraordinary, nay puerile and ridiculous to every one, except to Budhists. One great principle of that religious system, is that man does not differ from animal in nature, but only in relative perfection. In animals there are souls are well as in men, but those souls on account of the paucity of their merits, and the multiplicity of their demerits, are yet in a very imperfect state. When the law of demerits grows weak and that of merits gathers strength, the soul, though continuing to inhabit the body of animals, has the knowledge of good and evil, and can attain to a certain degree of perfection. Budhistic writings supply many instances of this belief. Whilst Budha was in the desert, an elephant

ministered to all his wants. As a reward for such a series of services, Budha preached to him the law, and led him at once to the deliverance, that is to say to the state of Niban. When one animal has progressed so far in the way of merits, as to be able to discern between good and bad, it is said that he is ripe, or fit to become man. The horse Kantika seems to have reached that state of full ripeness, since after his death, he passed to the state of Nat. This peculiar tenet of Budhistic faith accounts for the first of the five great commands, which extends to animals the formal injunction of not killing. When a candidate is admitted, according to the prescriptions contained in the sacred Cambawa, into the order of Rahans, he is expressly and solemnly commanded to refrain from committing four sins which would deprive him *de facto* of the dignity he has been elevated to. The taking away willingly of the life of any thing animated is one of these four trespassings.

NOTICES OF PINANG.*

MARINE.

Extracts from various Documents and Correspondence connected with the construction of Docks, Ship-building, and other Marine subjects.

Extracts from dispatches from the Government of Pinang to the Court of Directors.

May 1806. Mr Paul Tate, whom your Hon'ble Court have been pleased to appoint Assistant Engineer at this island, arrived in the "Euphrates," and agreeably to your orders, officiates until a Chief Engineer shall be sent out.

Mr Joseph Seaton, Master Ship-wright, and Mr James Foote, Assistant ditto, advised in your general letter of 19th June last, have also arrived.

* * *

As ship-building was one of your Hon'ble Court's principal inducements for promoting the administration of this island to the rank of a Presidency, we have, as the readiest means of bringing its capabilities to the test, come to the determination of laying the keel of a frigate of the larger class, so soon as we shall have procured a sufficient quantity of materials, in which we have already made some progress; and with a view that no time might be lost, a convenient situation has already been fixed upon, where the tide rises nine feet and deepens rapidly into four fathoms and a half, a ship's length from the shore; materials are now collecting to make a sole or foundation whereon ships may be laid with safety as soon as the Master Builder shall arrive, and it is satisfactory to inform your Hon'ble Court, that the situation so fixed upon, is such as will nearly connect the whole ship-building system as close together as can be conveniently wished.

It being necessary to employ water carriage, in the removal of the timber from different parts of the island and the neighbouring shores, we have thought it advisable to purchase a brig of 120 tons into your service for this purpose, and we have not a doubt but that she will soon defray the amount of her cost.

This vessel together with the "Albina" schooner and hulk "Dromedary," the former of which has been used as a Pilot vessel here, but which was found perfectly unfit for that service, have also been fitted for and employed in the transporting of timber, and we beg leave to inform your Hon'ble Court, that much valuable timber has in this manner been collected, at comparatively a small expence, as those vessels are manned with one European, a few lascars and convicts.

---

* Continued from page 236.

In order to obviate the expence of transporting heavy pieces of timber, which from their shapes, might afterwards be found unfit for the intended purposes, we have appointed Mr Robert Williams, a ship-builder at this place, to be purveyor of timber, whose duty it is to proceed to different parts of the island and neighbouring shores, to cut timber of proper shapes and transport them to the marine yard. In addition to the timber thus procurable, we have contracted for a supply of teak plank from Pegue, and have in consequence sanguine hopes, that we shall be enabled in due time to launch a respectable frigate as our first specimen of ship-building on a large scale at this presidency.

We are not satisfied however with the prospect of providing for His Majesty's Navy a ship of this class only, but we have extended our views further to the construction of ships of 74 guns. not of the timber of this island, which as we have already stated is uncertain as to its durability, but of the better ascertained quality to be procured from Pegue. A ship of this size is too expensive for an experiment, in consequence of which we have contracted for a gradual supply in due time of the timber that will be required from thence, the whole of which moulded ready fit for a third rate, will stand the Honorable Company in rupees 152,000 delivered here.

As the half of this sum is the amount of the freight from Rangoon, we trust this very heavy charge will satisfy your Honorable Court of the expediency of sending out a ship of 6 or 700 tons burthen, of the build usually employed in the Baltic Trade, which if navigated by a Master, Mate and a few Seamen, without an unnecessary and expensive establishment of officers, would with proper management in a short time reimburse you for her whole cost and sailing charges.

* * *

July 1806. We beg leave to call the particular attention of your Honorable Court to the subject of a tender lately made to us by Mr McIntosh, a Resident in the island, who proposes under certain conditions to build a ship of 1,200 tons burthen, on the plan of those usually chartered by the Honorable Company.

We have not hesitated to give our ready acquiescence to Mr McIntosh's proposal, and have willingly promised every reasonable aid in our power, towards the encouragement of a plan fraught with so many advantages to the Company and the immediate interests of this rising settlement.

Mr McIntosh proposes to construct at this settlement a ship of 1,200 tons burthen or upward, (provided the Hon'ble Company) will condition to assure a freight to the vessel from Canton in the season 1808, or in the event of any unforeseen accident obstructing the building, for the season 1809, precisely on the full terms of freight which your Hon'ble Court granted to the "Scaleby Castle," which was laden from thence last season, it being clearly understood that although Mr McIntosh's ulterior view is to place the ship in the Hon'ble Company's regular employ, he makes this no condition, depending alone on her construction as a mean to insure such employment.

In acceeding to this proposal we have little doubt of meeting the entire satisfaction of your Hon'ble Court, as the great advantages attending the success of such an undertaking must be observed.

Among the reasons which induced us to give our ready acquiescence to the plan are the following, which your Hon'ble Court will however find more fully detailed on our proceedings, an extract therefrom relating to this subject being forwardeds a separate number in the Packet.

We are of opinion that this plan must be attended with many solid advantages to the Company and the settlement at large, independent of its benefit in a national point of view.

1st. Because it will give encouragement to a resort of shipwrights and other artificers connected with the works we are about to carry on, without any expence to the Company, and the increased demand for timber in consequence, will no doubt add enterprize to individual exertion and open new sources of supplies of every kind that may be demanded.

2nd. Because it will place within the reach of the Hon'ble Company a ship of the most approved dimensions for their China trade, on conditions of freight already approved by your Hon'ble Court in the instance of the "Scaleby Castle" without your being bound to employ her longer than for one voyage, unless circumstances at the time shall render it expedient so to do.

3rd. Because the experiment will promote the construction of a class of ships so necessary for the China trade, the want of which must be felt in consequence of the capture of the "Brunswick" and the expiration of the voyages of several of your chartered ships of this description, the only class properly calculated for that trade.

4th. Because it will prove in some measure the capability and resources of this island at the risk only of the individuals who undertake it, and be the means of drawing many of the natives composing the population of the island and its neighbourhood, from their habits of indolence to the more active occupations of useful artificers.

5th. Because such extensive undertakings on private account must tend to the ready and advantageous sale of your marine stores, in the article of iron and other essentials of building and equipment.

We have the satisfaction of annexing to the extract of our proceedings on this subject, Copy of a letter from His Excellency

Rear Admiral Sir T. Troubridge, Baronet, Commander-in-chief of His Majesty's Ship &c. whose opinions we are happy to state entirely coincide with our own.

We have only to add on this occasion that in looking forward to your Hon'ble Court's entire approval of our acquiescence in and encouragement of this promising plan, we shall, whenever the same does not interfere with the more extensive public measures to be carried on here, deem it our duty to afford every aid to the undertaking on the same principle that we first agreed to it.

To Paul Tate, Esquire,
Officiating Chief Engineer.

Sir,

I am directed by the Hon'ble the Governor and Council to express to you their satisfaction at your arrival, as appointed by the Hon'ble the Court of Directors to do the duties of Civil Engineer, an office under the particular circumstances of this Presidency of great trust, and on the due execution of which much of its success and prosperity will ultimately depend.

1. Much valuable time having already been lost to the service, from the delay in your appointment and the want of a duly qualified person to examine into and report on the practicability of constructing Dry Docks at this island, fit for the larger rates of ships of His Majesty's Navy, the Governor and Council are most desirous that you should as expeditiously as possible proceed to examine the shores of the harbour, to enable you to form an accurate judgement of the situation, which on the whole view of the case you shall think fit to recommend as the best adapted for forming one or more Docks to receive ships of the rate above mentioned; keeping in view the having sufficient space in its immediate neighbourhood, for erecting the necessary warehouses, workshops, and all other buildings which an establishment on this extensive scale may require, nor forgetting the very material point of the facility which such situation may possess of being effectually fortified against the attack of enemies from sea or by land.

2. For the purposes of a Dock Yard, two different sites on the island of Jerajah have been recommended by professional men, and others on the eastern shore of this island itself, from the present principal landing place to the southward, as far as the Sungy Cluan river, all of which have the recommendation of being within the shoals bounding what is called the Inner Harbour, and consequently are more difficult of approach to the enemy's ships, but this consideration, though of much importance, and justly entitling any one situation to be preferred to another where the other circumstances of each are equally convenient, is not of so material consequence, as to decide on placing the Dock-

yard there, in preference to any other which you may discover elsewhere on the island, where there may be the superior advantages of a greater rise of tide, better foundation, a back water from some of the rivers, or other of the various requisites which must determine the place most eligible for commencing the intended works.

3. The Hon'ble the Governor and Council therefore recommend that you examine the whole coast of the island, and after giving every circumstance its due weight and the most mature consideration, that you report to them your opinion, with the reasons on which that opinion is founded, as to the most eligible place for constructing the intended Docks with building slips and warehouses adjacent thereto, keeping in mind the necessity of well weighing every possible circumstance connected therewith, so that no unnecessary expences of treasure or time may be incurred, by beginning such extensive works, as are required for an establishment of this kind, in a situation, which (on being found unfit or inferior to some other) we may afterwards be induced to abandon.

4. In the course of your examination, the Hon'ble the Governor and Council desire that you direct your immediate attention to point out what is the most convenient place for laying the keels of a 3rd rate and a large frigate, which they are desirous of proceeding upon without delay and without waiting your report as to the situation best calculated for permanently establishing the marine yard.

I am, Sir,
Your obedient humble servant,
(Signed) H. S. Pearson,
Secy. to Government.

Fort Cornwallis, 2nd June, 1806.

To H. S. Pearson, Esquire,
Secretary to Government.

Sir,

I have the honor to acknowledge the receipt of your letter of the 2nd of June, expressing the satisfaction of the Hon'ble the Governor and Council at my arrival, and communicating to me their orders that I should as expeditiously as possible, consistent with the importance of the subject, report my opinion, with the reasons on which it is founded, as to the most eligible place for constructing Docks with slips, store-houses, &c. &c. Having in pursuance of these instructions of the Hon'ble the Governor and Council, carefully examined both upon the flood and ebb of a spring tide the situations pointed out by them, as well as various others the most favorable for a naval arsenal on the shores of this island, Pulo Jerajah, and the opposite side of the Province of Wellesley; and after having maturely considered the advantages of each and the local difficulties which at present appear, the accompanying report will I hope prove satisfactory, the principal points being arranged in as clear a manner as I have been able to place them in order to give a just statement of the subject.

The sections paper No. 1, with explanatory remarks shews the means I have devised for excluding water from the Dock. Should these means be adopted I can venture to affirm, that with the usual aid stated in the additional remarks, not a doubt remains in my mind as to the practicability of the scheme of constructing Docks, fit for the larger rates of His Majesty's Navy, on the western side of Pulo Jerajah, on a spacious spot the best that I have seen for the purpose, where the arsenal may be effectually protected against the attack of any enemy by sea.

As the general plan will, in a great degree, be regulated by the hill water in the dry season, it is impossible from this and various other circumstances to make a specific estimate at present. In England where there are undertakers for almost every branch of labour, estimates are frequently very erroneous, therefore, how much more difficult it must be on this island, to make an estimate with any degree of accuracy, where everything is new and the people unpractised in the work. So much depends upon the nature of the ground and various obstacles which may lay concealed, that I conceive all specific estimates should be partly proceeded on. This would afford the engineer an opportunity of forming a calculation on various departments of labour, particularly in masonry, which will be the most expensive. In the event of constructing two Docks with a reservoir and steam engines, this simple plan, which I conceive to be the most economical, perhaps the best adapted to the spot, will not, I think, on a conjectural estimate exceed twelve lac of rupees, including contingents and all the requisite building except the fortifications. But in order that my Hon'ble employers should embark as little property as possible on precarious grounds, or upon any design of mine, more especially as I have *not* the advantage, as in Europe, of comparing my ideas upon the leading points generally digested and resolved upon by a collective body of the ablest Civil Engineers in the kingdom, these weighty considerations and the acknowledged difficulty of the task, induce me to submit the propriety of putting the means I have devised for executing the most difficult part of the works, to the test in the first instance. Admitting the Hon'ble the Governor and Council deem it expedient to act upon the means alluded to, the expense of a fair trial will not I think at the utmost calculation exceed the sum of sixty-five to seventy thousand rupees. This test will be particularly satisfactory, as it will ascertain whether my zeal to fulfil the duties of my office has led me into opinions not easily reduced to practice on this island, and by adopting this prudent course, whatever be the event, it cannot be said unnecessary expences have been intentionally incurred, or that I have been influenced by personal considerations or any motive whatever, incompatible with the welfare of my country.

Notwithstanding I have given this subject my most mature consideration and have not once wavered in my opinion as to the practicability of the undertaking, I shall be most happy to execute any suggestions of the Hon'ble the Governor and Council, should they be pleased to direct me to proceed thereon. By adopting the test I have now the honor to submit, my estimates drawn from facts founded on experience, would silence misrepresentation, an early confidence being established, would give spirit and energy in every department under my charge, and the dry season would be approaching favorable for the general operations.

I beg leave to add that I have drawn out this report, I have now the honor to submit, with all the caution and reflection a subject of such importance demands, and have exerted my utmost zeal in laying it before the Hon'ble the Governor and Council, as correct and free from error as the nature of circumstances will possibly admit.

I have the honor to be,
Sir,
Your most obedient and humble servant,
(Signed) Paul Tate,
Officiating Chief Engineer.

Fort Cornwallis, 19th August, 1806.

Report of Paul Tate, Engineer, concerning the practicability of constructing Docks and the requisite erections for a Naval Arsenal on Prince of Wales Island, the Province of Wellesley and Pulo Jerajah.

On examing the ground near the landing place, the usual spot for ship-building, I did not find it so favourable as it has been represented. There is a long flat composed of sand, clay and mud. I have understood that on erecting the landing place, a pile of about eighteen inches diameter, when elevated on its end, suddenly sunk upwards of 14 to 16 feet into the mud with its own weight. This fact is a strong proof that the ground is very loose and not sufficiently cohesive to make piling of much use. In a saw-pit about sixty feet from the water's edge, the sea oozes through at every rise of tide, and it is fair to conjecture, that there is not a regular stratum of clay or gravel of sufficient thickness to make a sound foundation without going to that depth, which would render the undertaking very expensive and hazardous. This opinion seems to be experienced in the circumstance of the land at the point having been washed away to the depth of near five fathoms, for had there been a regular stratum of clay or gravel it might be expected to appear on the side which accumulates, which at present seems to be entirely sand.

In the attempt of making a solid pier at the end of the landing place, a cassoon of considerable base and moderate weight sunk upwards of twelve feet into the mud, which is another corroborating circumstance as to the bottom being unfit for heavy work. The rapidity of the tide is also a very great disadvantage, but admitting these obstacles did not exist, the circumstance of the ground accumulating on one side and diminishing on the other, renders the entrance into Dock very liable to be choaked with sand drift, which will alone more than counterbalance every convenience which can be fairly stated in its favor.

These observations partly apply to the plot of land opposite the western side of Pulo Jerajah, which I have understood Mr Scott tendered to Government. This ground is better calculated for holding out water than it is at the point, but the great distance required to extend piers in order to form an entrance, would be attended with a very considerable expense. Reports are contradictory with respect to the healthiness of Sungy Cluan or James Town. The Chinese who reside there appear to be healthy, but the Malays on the opposite shore complain of the wind when it it blows over the mangrove swamps. I have found the air very noxious at Sungy Cluan and on the shore, and it is fair to conclude that if piers were made mud would accumulate and on being more exposed to the action of the sun the evil would be increased. Back water is not of much consequence when it is considered that a steam engine will be necessary to draw the foundations and when erected the power may be applied to various purposes, at a less expense than conducting water from hills. Little is gained by back water when brought from a great distance or to be raised by a steam engine or any other power. Sungy Neoling, Sungy Dua either of this rivulets are equal to the supply of a Dock Yard, however extensive, but as they disembouge themselves into very shallow water, they are useless for the purpose in view, from this circumstance and the long mud bank which runs nearly parallel with the bank opposite Mr Scott's mangrove jungle.

I have not had time to examine the west side of the island nor does it appear to me to be necessary, as I am informed by those who have been there, that it would be difficult to have any communication with the shore during the south-west monsoon. In the large bay in the centre of the island, the water is shoal to a great extent, these disadvantages added to the circumstance of the projecting land at each extremity of the bay being too distant to support each other, renders the place difficult to fortify and consequently unfit for a naval arsenal, in the opinion of those who have examined the place.

Respecting the Malay Shore or the Province of Wellesley.

On examining Pris Point the tide appeared to be very strong.

On the shore there is a great surf and a heavy sea when the wind blows hard from the northward. Sand lays in immense drifts and evidently accumulates. Notwithstanding there is not less than two fathoms at low water on the bar, the channel is so narrow and winding, that a line of battle ship would scarcely be able to swing. The ground is flat and swampy. To the southward is a very extensive mangrove jungle, the luxuriance of which, from the circumstance of the tide overflowing it for some miles, renders it very difficult to clear, and when cleared it would be a salt marsh, which is likely to occasion sickness. There are several inlets which I examined with the view of converting one of them into a dam to turn a tide wheel connected with pump work in order to discharge water out of the docks, but the small rise of tide and the circumstance of the freshes being very strong, insomuch as to overflow the country much above the banks of the river, renders the scheme of making docks difficult if not impracticable for large ships. There is another objection, for in case of a misunderstanding with the King of Siam, it would require a very strong force to defend the arsenal and the whole of the enemy's forces could be easily brought against us.

Respecting the capital being removed during my researches, I have not seen any situation more eligible than Battu Lanchan, recommended by Colonel Kyd. The soil is dry and the ground flat and spacious. The hill is very favorable for defence.

Observations made upon the spot respecting Pulo Jerajah.

1. That the inlets marked No. 1 and 2 in the sketch when a small hill is removed contains about twenty-seven acres of flat ground, which is space sufficient for a dock-yard and all the necessary erections.

2. That on the ground close at the back of the inlet No. 2 is a spring of very pure water. At some seasons from the largeness of the gullies or excavations in the rocks it is reasonable to suppose that there is water sufficient for a dock, but if we can at all rely upon what the natives affirm, there is water to supply two steam engines at the dryest season.

3. That the intermediate hill shewn in the sketch, is very favorable for defending both inlets also the northern and southern entrance, and the entrance into dock will be about fifty to sixty yards from the muzzle of the guns.

4. That on the northern point of the inlet, now called by the Malays Sabadagong, is a very bold shore, insomuch that in the projecting rock on which the bungalow stands, there is about four fathom water, not exceeding fifty-five feet from the shore and as neither mud nor sand accumulates there is nothing to apprehend as to an entrance on this spot being choaked.

5. That notwithstanding it has been conjectured, that the

southern channel is likely to be choaked, there does not appear any reasonable grounds for this conjecture, for by comparing Col. Kyd's survey made many years ago with Mr Macarthy's late survey, the channel does not appear to have undergone any alteration.

6. That the shore to the southward of the projecting rock, inlet No. 1. has a stratum of granite covered with mud mixed with sand of not sufficient thickness to make piling of any use. Part of the shore consists of large blocks of granite, intersected with long fissures which communicate with the interior; nothing but the power of a steam engine reserve is likely to discharge any sudden influx of water.

7. That as far as I have been able to make an experiment, the rock under water will not be difficult to cut. This opinion is partly confirmed in the use of water with stone cutters and the circumstance of glass being easily cut when immersed in water.

8. That at the extremities of the inlet there are considerable quantities of detached blocks of granite nearly in shape and size suitable for the massy part of the works. Stone thus formed by nature is a very important acquisition. This material, added to what will be cut in excavating the entrance formed out of a solid rock, will cost little compared with the expense of procuring it from the opposite shore.

9. That an entrance cut out of a rock is not expensive, when it is considered that the same labour would be necessary in procuring stones from a quarry, besides the expense of carriage, and a entrance thus made would be very secure and a dock built of stones would be much more solid and durable than one of brick.

10. That notwithstanding the lime of this country does not make so strong a cement as what is used under water at home, by referring to the additional remarks, there appears to be some probability of procuring puzzalano to mix with it.

11. That wood the growth of the island will serve for the greater part of the works. It appears to be very strong and durable, this fact can be ascertained by examining several logs which have remained in the inlet some years without the smallest traces of decay.

12. That the rise of spring tide when I measured it was seven and a half to eight feet, but I have understood from the person employed by Governor Farquhar to ascertain this point, that it has occasionally risen nine feet.

13. That notwithstanding it is reported that Pulo Jerajah is not healthy, from my own experience I think otherwise. During the time I was there I enjoyed better health than I have since my arrival in India, though I have been much exposed to the sun and fatigue in penetrating a thick jungle in order to trace the source of the springs on the hills. These exertions which are often fatal to Europeans had no bad effect upon me, which I can

only account for from the purity of the air where the jungle is cleared and the purity of the water.

14. That the jungle being cleared is not likely to materially affect the springs as the ground to the northward might remain uncleared, but the intermediate ground to the water's edge should be entirely cleared of underwood only and allow the wholesome large trees to grow. Thus you would have the supply of a forest, that would afford the shade of an avenue, with the advantage of being well ventilated, for if the air can circulate freely there is nothing to apprehend though the sun should be excluded.

15. The land being a chain of mountains with inclined intervening gullies there can be no noxious vapours arising from stagnant water, and provided the leaves are collected and burnt before the rains set in the putrid vegetable matter which generally occasions the jungle fever, would be destroyed,—stubbing the underwood would prevent it growing again, and the value of the land would be so much increased that it probably might pay for the expense of stubbing, and from the variety of aspects and soil it is reasonable to expect that if properly cleared and protected that it might be farmed to advantage. If this plan is carried into execution there is every physical probability of the air being rendered salubrious, at all seasons, but even in its present jungly state, I think it is more healthy in the western side than on the eastern side of the shores of Pinang. The southerly winds which are found very unhealthy are not so in Pulo Jerajah, this may be accounted for from the wind not blowing over the noxious mangrove swamps and mud banks which extend from James Town to the point near the landing place.

16. That Pulo Jerajah being the sole property of the Hon'ble Company in a point of great economical consideration, in addition to which it spontaneously produces materials for building of almost every description, namely, excellent wood, stone, sand and gravel. At the south end is coral rock, which when properly prepared will make common morter. The red earth similar to what is used at St. Helena, when mixed with lime, will serve for granting. Dammar and wood oil produced on the spot will be very useful for various purposes under water.

17. That nature has been very bountiful in having formed an inlet that affords the most essential conveniences of an artificial bason and will save the expense of making one. It is completely land-locked, the water smooth and the entrance into dock out of tide way. This last convenience will greatly facilitate the operations by having the weight of the water to resist without the force of the current.

18. That vessels may lay in six fathoms water within fifty yards of the shore, secure from all winds. They may be worked into dock from the southward in a few hours, taken out by the same means even against a head wind, which is a very important

advantage in the event of the enemy being near the island. The arsenal may be effectually protected by sea, as ships must come in through the southern channel, so that a very small battery placed as in the sketch would greatly annoy the enemy, whose guns cannot easily bear against the fort. The hills are not in my opinion unfavourable for defence by land, for by judiciously applying the power of the Steam Engine the whole of the artillery might with great facility be conveyed to any of the heights to resist the approach of an enemy. These and the aforementioned advantages are seldom united on the same spot and it only requires such aid in the execution as is found necessary to render the scheme of making docks &c. both practicable and tenable.

(Signed) Paul Tate,
Officiating Chief Engineer.

Fort Cornwallis, the 19th August, 1806.

Honorable Sirs,

Having occasion for 30 Convicts to make some experiments at Jerajah, I request you will be pleased to order these number with provisions for one week. The men will be wanted to-morrow morning at 7 o'clock.

I have the honor to be,
Honorable Sirs,
Your most obedient humble servant,
(Signed) Paul Tate.

Fort Cornwallis, 10th June, 1806.

To Paul Tate, Esquire.
Officiating Chief Engineer.

Sir,

In reply to your letter of this date, I am directed to acquaint you that the 30 Convicts therein requested cannot at present be spared.

I am also directed to inform you that the Honorable the Governor and Council are desirous of knowing for what purpose these men are demanded, not being aware that any part of their instructions to you renders the trying of experiments necessary, as mentioned in your former letter on this subject, nor of what nature such experiments are, requiring the labour of 30 men to execute them.

To the Hon'ble Phillip Dundas,
Governor and Council.

Hon'ble Sirs,

Not having peons for the service of my profession, I had not the honor to receive your Secretary's letter of the 20th instant until this day. In reply to the following extract:—"That the Hon'ble the Governor and Council are desirous of knowing for what purpose these men are demanded, not being aware that any *part* of their instructions to you *renders* the *trying* of *experiments necessary*, as mentioned in your former letter on this subject, nor of what nature such experiments are requiring the labour of 30 men to execute them," I shall first quote the following paragraph from your letter of the 2nd instant and will then prove, I hope to your satisfaction, that I have strictly adhered to the tenor of your instructions. "That I should as expeditiously as possible proceed to *examine* the shores of the harbour which on the whole view I shall think fit to recommend as the best adapted to form one or more docks." And to do this I had recourse to the following means, or what you are pleased to call experiments :—

1st. That as the inlet on the western side of Pulo Jerajah called Lubadagong is the most likely spot I have hitherto been able to find for a Naval Arsenal, it was necessary in the first instance to ascertain whether there is fresh water in quantity sufficient to supply a steam engine &c. &c. After making several unsuccessful attempts to ascend the hill, from whence the principal spring is said to issue, the jungle being impenetrable, rendered it necessary to cut a road, consequently men and tools were necessary. I must here beg leave to explain, that so important is the nature of this inquiry that however bountiful nature may have been in other respects, a deficiency of water at any time of the year, will render the place of no possible value.

2nd. That as I suspect there is a rocky stratum under a body of sand mixed with clay and mud and as I have good grounds for thinking that the sand &c. is not sufficiently *deep* nor *cohesive* to admit piles being driven to exclude water agreeable to the practice in Europe, I ordered a pile to be made, and shod with iron which would ascertain two indispensible points. 1st.—The distance and texture of the rock. 2nd.—Whether the ground was capable of sustaining the force or weight of the water with the aid of a coffer dam; for by driving a pile of sufficient depth and calculating the number of blows it takes with a ram of suitable weight to drive an inch, I should be able to form a tolerable accurate idea of the practicability of the scheme. Thus it appears that men and engines are necessary. Admitting there had been a boring machine of any use or admitting there had been artificers under my orders to have made one in any reasonable time, part of the preceding operations would not have been necessary.

3rd. In order to examine the interior of the inlet I had recourse to sinking a well first to ascertain the strength of the springs and the thickness and nature of the different strata, also if water at the foot of the hills might not be found in quantities sufficient to supply a steam engine, and to do this men are necessary.

After having stated thus much it only remains with me to add that with every due deference to your opinion as to my deviating from my instructions, I can venture to affirm that the aforestated plans I have partly adopted, are such as I conceive to be absolutely necessary to ground a just or rational report, I can also prove that the 30 men are a very small number compared with what are employed in Europe for similar purposes. Permit me to ask what is the assistance of 30 of these feeble unskilful convicts compared with 40 Englishmen which the great Smeaton often employed to examine into the nature of the undertaking before he would make a Report. I have frequently perused the Reports alluded to, and am proud to confess that I have not deviated from so great an authority. And that I might meet your wishes in the saving of time, I have excluded myself from society, in an unhealthy jungle, that I might devise some plan to render the undertaking practicable. And though the difficulties, (in all Smeaton's Reports there is nothing that applies to them), are both novel and formidable, I think they may be removed, and on duly weighing the reasoning I have adduced, I trust you will have no reason to alter the sentiments you have done me the honor to express on my arrival. But if I have erred in judgment or conduct so the sooner I can be convinced the better and if this charge can be established, I must certainly be a very unfit person to direct the operations of a work of such vast importance to my country.

I have the honor to be,
Hon'ble Sirs,
Your most obedient and devoted
Humble servant,
(Signed) Paul Tate.

Fort Cornwallis, 25th June, 1806.

To Paul Tate, Esquire,
Assistant Civil Engineer.

Sir,

In acknowledging your letter of the 25th instant, addressed to the Honorable the Governor and Council, I am directed to inform you, that they consider your conduct in addressing them in the manner you have presumed to do in that letter, as highly disrespectful to them and improper in you, as a subordinate officer in their service, and altogether so deserving of censure and punishment, that were they not convinced it could have been dictated only by your ignorance of what is decorous and becoming in a person in your situation under them, they would have immediately suspended you from your office and sent you to Europe by the first opportunity.

2. The Hon'ble the Governor and Council cannot admit of any Officer in their Government discussing the terms they may think proper to make use of in calling for an Official Report on any prescribed subject, nor do they deem it right (such terms

having been once adopted) to descend to a justification of them, on which principle your animadversion on their orders, in the following words in the 2nd para of your letter:—"and to do this I had recourse to the following *means*, which you are *pleased to call* experiments," is quite unbecoming, even if the Governor and Council had so denominated your *means*, but in this case even the cause of your remark, originated with you, for your first request for the thirty men, to be sent to you, isdeclared in your own words "for the purpose of making experiments," the Governor and Council therefore were pleased to adopt your words, and not to introduce new ones of their own.

3. The Hon'ble the Governor and Council will hereafter on more mature experience, judge of your professional fitness which you allude to towards the close of your letter, and a reference thereof to the Court of Directors will satisfy them, as it has the Governor and Council, of your general fitness in point of judgement and conduct for executing the trust they have reposed in you, and how far it may be necessary for them, not to delay sending some competent person to take the head of the department in which you now officiate.

4. In conclusion, I am directed to recommend to you in your future communications to the Hon'ble the Governor and Council (which you will hereafter according to usage, address to the Secretary to Government) to abstain from all circumlocution and remark of every kind which the subject may not necessarily call for, and to answer concisely and respectfully on whatever may be referred to you.
I am &c. &c.
(Signed) H. S. Pearson,
Secretary to Government.

Fort Cornwallis, the 26th June, 1806.

To H. S. Pearson, Esquire.
Secretary to Government.

Sir,—An over great zeal to execute what I considered to have been the duties of my office, having led me, perhaps unnecessarily, to importune Government to carry on preparatory experiments before the rains set in, and it now appearing to me that my application was unseasonable and that I was also mistaken in the construction of the letter I had the honor to receive from Government, I confidently hope, that if I have obtruded sentiments with indiscreet zeal without the intention of giving the shadow of offence, that my letter of the 25th instant may be considered as not official and that I may be permitted to withdraw it.

I have the honor to be,
Sir,
Your most obedient, most humble servant,
(Signed) Paul Tate.

Fort Cornwallis, 26th June, 1806.

Observations proving that jungles ought to be stubbed in preference to the Malay method of clearing them, for by leaving the roots in the ground, the decomposition which takes place generates air destructive to life, as will appear from the following fact:

On the 5th of August I made the following experiments in the compound of Mr James Scott, which *had been a mangrove jungle.* I placed a glass with the mouth immersed in water, and by probing eight to ten inches into the ground, I collected as much gas in about five minutes in this imperfect way, so as to prove the fact, for when in contact with water it took fire by the application of a body ignited; the peculiar smell and every chemical test I could make confirmed my opinion as to its being best hydrogen. I put a bird under a glass which contained gas thus obtained; in less than half a minute it was violently convulsed and apparently expiring, on the admission of atmospheric air it recovered. The roots of trees producing hydrogen is nothing new but that it can be obtained in such quantities under such disadvantages is extraordinary.

(Signed) Paul Tate,
Officiating Chief Engineer.

To Thomas Raffles, Esquire.
Secretary to Government.

Sir,

Finding that the machinery which the Hon'ble the Commissioners of His Majesty's Navy authorized me to order, is arrived without the artificers pointed out to them as absolutely necessary to attend the engine and keep it in order, I think it incumbent on me to submit to the Hon'ble the Governor and Council a few remarks upon this important subject.

Suppose the engine to be erected and every other branch of labour provided for, the whole undertaking would be at a stand, until proper people are sent out. The loss to my Hon'ble Employers in this case would be very great, the interest upon a very heavy stock of machinery &c. &c. and the Engineer would have no opportunity of carrying his plans into execution with the probability of success.

Agreeable to what I have stated, under the head additional remarks, namely, that as drawing the foundations may require the constant exertion of the engines, it cannot be expected that one man can attend them day and night, I therefore think that the most prudent plan would be to have two men to each engine, or a man and his apprentice.

Having stated thus much, I beg leave to submit the expediency of an assistant being sent out in my own profession, for it is utterly impossible in a place where people are unskilful in almost every department of labour, that one Engineer can carry on the works to advantage: for admitting his health would allow it, he would be double if not treble the time, he otherwise would be with such assistance, as is found absolutely necessary at home. In addition to those reasons, my present sickness is a striking instance of the necessity of having a man of science who can follow up my plans, when I am not able to attend the works, which are of too much importance to depend upon the health of one or even two men.

From what I have had the honor to submit, I confidently trust that the Hon'ble the Governor and Council will concur with me, in the expediency of what I have stated, and that they will be pleased to forward the same to the Hon'ble the Court of Directors.

I have the honor to be,
Sir,
Your most obedient humble servant,
(Signed) Paul Tate,
Officiating Civil Engineer.

Fort Cornwallis, the 28th October, 1806.

To Thomas Raffles, Esquire,
Secretary to Government.

Sir,

In answer to your letter of the 9th September, I have to acquaint you for the information of the Hon'ble Board that I have duly received, read and considered the report and accompanying remarks of Mr Paul Tate, the Acting Engineer, respecting the proposed Docks, and I request you will lay before the Board the following observations on the subject:—

It had always been my belief that this station was very capable of affording Docks for large ships and men-of-war, and from various enquiries made and personal examination since my last arrival here that belief is confirmed.

Respecting sites for these Docks a difference of opinion may fairly prevail, but as Mr Tate has been sent out hither expressly for the purpose of judging on that point and of carrying on the works, and with respect to the mechanical operations the manner of carrying them into effect, and the spot most advantageous for all such works, as he must be much better versed in them than me, I should be very cautious to differ from him did I now see cause to disapprove of his report. Giving him therefore full credit upon that score, I think his plan as recommended should at all events be commenced upon, especially as the trial according to his calculation will, should it even fail, be productive of a very trifling expence compared with the expected advantages.

I have experienced not a little regret at finding my opinions and suggestions so little regarded in the conduct of affairs in general in this island, since my assuming the station I hold, but notwithstanding I feel myself compelled, though perhaps for the last time, to remark, that for the purpose of building ships of war, forming Docks and a naval establishment, we were expressly nominated and sent out to great and expensive appointments here, that if the station be found incapable of such a purpose, the expense is not only useless but a serious grievance to the Hon. Company, that we have been landed here upwards of one year, without any such work being undertaken, that it is expedient we should determine as speedily as possible whether the proposed plans for the island be feasable or not, that no time should be lost in carrying them into execution, especially as the time is in every respect favorable to make a beginning, as the money recoverable from the orphan fund at Malacca and from the produce of the spices going to China for sale, will afford funds for pursuing the works.

This letter must not be dismissed without my opinion expressed on a point which I consider of much consequence, which is, as the greater part of timber contracted for by the Hon'ble Governor for the purpose of constructing a large frigate, has been landed here from Rangoon, and as the Chinese carpenters, sixty or thereabouts in number, have been employed, I cannot help recommending a frigate of the largest dimensions being immediately laid down.

I am, Sir,
Your obedient humble servant,
[Signed] A. Gray,
Supt. of Marine.

Fort Cornwallis, the 18th November, 1806.

The Hon'ble Philip Dundas, Esquire.
Sir,

1. I have the honor to send you herewith a plan of the whole of Pulo Jerajah with the coast line of the east side of Pulo Pinang from Battoomoan, to the north extremity of Soonghy Glugore nearly, and an exact survey of the east Channel, leading to that island from the sea, and agreeably to the instructions which you were pleased to give me I have accurately laid down the middle sand which forms one side of that channel, the edge of which as far as two fathoms I have ascertained trigonometically from every point of that island, joining it by boats stationed at different points on the sand, while I took angles to them with my Theodolite from the shore so that the breadth of the channel at all points might be immediately ascertained ; I have also given land marks for a ship coming from sea, and bound in that channel, an attention to which will I think prevent their running on the middle bank or one side, or approaching on the S. E. point on the other side of which a shoal runs a small distance.

2. I have of course kept in sight that part of your instructions which mentioned that should I in the execution of my duty at that place, be able to make any observations which I thought might be of use for the information of the engineer, to communicate them to you. The only one which my very slender ability that

way has enabled me to do, is that I think that should be a dock be built on the west side of that island, that nature perhaps has never done more for the defence of a place from sea than she has in that spot, for a ship of war coming in there must of necessity pass within two hundred and fifty yards of Stoney point where I think a battery might be built to destroy her ere she passed it; for she must approach it end on, and from the height at which a battery might be built, it would have a bird's eye view of her deck all the time, and they in the ship would not be able to elevate a gun to touch the battery, this is however what I should not venture to risk an opinion on, had I not your commands to that effect, from my sense of the little knowledge I have of the Art of Fortification which will I hope apologize for doing so.

3rd. I have given a plan upon a large scale of the plots of ground on that island apparently eligible for building a dock with their contents in Acres, which I shall be happy to hear meets your approbation, the whole is destitute of ornament but I trust it will be found accurate and that will be an excuse for the former.

I have the honor to be,
Sir,
Your most obedient and humble servant,
(Signed) J. McCarthy,
Surveyor.

P. W. Island, the 5th July 1806.

To Thomas Raffles, Esquire.
Secretary to Government.

Sir,

In reply to your letter which I had the honor to receive on the 18th ultimo, requiring another copy of my plans for docks &c. &c., I beg leave to state for the information of the Hon'ble the Governor and Council that at the time I received your instructions I was sick with a severe attack of the jungle fever which rendered me unfit for business; but having completely recovered I shall commence my labours agreeable to your orders as soon as I can get a suitable supply of materials, for which I have written to Madras and shall write to Calcutta. In the mean time I beg leave to submit the expediency of completing the models I had in in hand previous to my indisposition. I think under all circumstances well considered it will be employing my time to the best advantage, more especially as the Chinese carpenters &c. &c. can work from model but from the trials I have had they have not the smallest idea of draught. This fact induces me to suggest the propriety and benefit likely to be derived from teaching a skilful Chinese to draw to a scale so that he would be able to teach others, but at all events he could explain to the workmen the different proportions &c. I considered the plan so far back as eighteen months ago and have drawings in my possession, which I made on my passage from Europe, calculated to instruct with the greater facility and having made enquiry as to the most likely man to answer the purpose, I find that a Chinese who is at present at Malacca is a person likely to answer the object in view; he was employed by Mr Smith to draw and make copies, and probably may be engaged for the reasonble sum of 25 to 30 dollars per month, being the sum his late master gave him.

As it will be eight to ten months ere any thing very material can be done towards furthering the object in view, it may be proper to state by way of explanation that when I proposed to prove the practicability of the design I had formed for constructing *the most difficult* part of the works for the small sum of seventy-five thousand rupees or thereabouts, I fully relied on the assurance I had the honor to receive from the Hon'ble the Court of Directors so far back as 1st October 1805. The following is the paragraph in point which I officially received from the Secretary:—"that with respect to the Steam Engine, ordered by the Navy Board, the Court will procure two persons for working the machinery and keeping it in repair, who will be permitted to go out with the Steam Engine when it is complete and ready to the shipped."

With this machinery, masons and two working Engineers, added to the important assistance I had good grounds for expecting from His Excellency Sir Thomas Troubridge, in furnishing me with a mill-wright and artificers of every description to put my plan to an undeniable test, as stated in my letter which accompanied my report on the 19th of August last, I was induced through the aforementioned aids to submit my plan or proposal to Government, but being disappointed in the assistance I at one time had no doubt of having, will I trust justify my request in being permitted to rescind the proposal alluded to, until such time as I have such assistance as is found absolutely necessary in Europe, in undertakings of the same nature.

I have the honor to be,
Sir,
Your most obedient humble servant,
[Signed] Paul Tate.

Fort Cornwallis, the 24th Decr. 1806.

Minute by the Hon'ble the Governor.

I have bestowed my best attention in the consideration of this report from the Acting Civil Engineer, on the subject of the most proper situation for commencing on the proposed Docks and Naval Arsenal, and the means of executing the same, referred to him soon after his arrival here, as being of the most essential importance to the island, and in itself one of the principal motives which induced the establishment of its present Government, since it has been in my hands when returned by Mr Gray, the Superintendent of Marine, in his letter of the 18th November, to whom as the head of the department to which this matter naturally belongs, it had been referred on the 9th September last.

1st. Having done so and seeing that Mr Gray in his letter above referred to, has given his opinion, that the plan as recommended by Mr Tate should be commenced on; it is with regret that I confess that I cannot thro' the whole of Mr Tate's paper, find any plan for a Dock recommended as preferable to another, on which we might commence, for the whole of his recommendation as far as I have been able to follow it, goes to a proposal of laying out not a trifling sum but (on a confessedly vague estimate) a sum of 60,000 or 70,000 rupees on the trying an experiment on the exclusion of water by a sort of Coffer Dam, on a rocky foundation, being one small part of one of the very various operations, which must be carried on in the execution of the great undertaking of erecting a Naval Arsenal with all its different accommodations.

2. But while we are trying this expensive experiment of excluding water from works on a rocky foundation, we have neglected to make out that it is a rocky foundation on which we are to work, and if it should not be so, the whole of Mr Tate's experiment is (as far as we are concerned) unnecessarily to be made; for though in the present imperfect state of our information on the matter, I agree with him that Pulo Jerajah holds out the most promising appearance for a proper site for the intended works, which indeed is no new discovery, it having been so held since Colonel Kyd's original survey, at least has been pointed out as such in some of the printed histories of the island, still I do not think that Mr Tate, as far as appears from his report, has as an Engineer bestowed due attention in making or drawn due comparison between Pulo Jerajah and the ground near the present landing place which he slightly notices, nor that near the mouth of the Pinang river, both of which in my mind hold out advantageous points for consideration before fixing on a spot as the fittest on which to commence the extensive and very expensive works proposed. Mr Tate's objections to the first of these situations is, in his own words, the having understood that in the erection of the landing place (or wharf) a pile of about 18 feet diameter when elevated on its end, suddenly sunk upwards of 14 or 16 feet in the mud with its own weight. Now a professional man should not have taken this fact on such an authority, as understanding it from others (not scientifical) men, but should in my view of the case, have made such experiments on the nature of the soil, as might satisfy himself, on one of so much importance, in drawing him to a conclusion.

Nor can I agree with his reasoning, on the deduction he makes from the circumstance of the caisson at the termination of the wharf having sunk 12 feet in the mud. This circumstance took place before our arrival, and consequently before Mr Tate's; he therefore in this instance also reasons on *hearsay* evidence, upon which he draws the conclusion of the failure of the project from the badness of the foundation. I have heard that the Caissoon was built square, that is on a rectangular floor, which if placed on a shelving foundation, must of necessity, stand higher on one side than the other and it is equally evident that on a rising tide the water would first flow over the lower side, which might overset the whole, or at any rate cause it to slide from its situation and to be lost, and I conclude that the project failed from the want of science in the projection, which must ever ruin projects so founded, and by such men undertaken to be executed.

3rd. On the whole, then, though I am inclined to agree with Mr Tate, in prefering Jerajah as the situation for the Naval Arsenal and Docks; I do not think enough has been set forth by him to encourage us, or even to justify us in going on with his experimental project, as proposed to be done by Mr Gray, because he (Mr Tate) has been sent out to us for the purpose, which is not in my opinion a sufficient reason for our risking the laying out a considerable sum of money, when eventually it may be proved to have been uselessly bestowed. I am further of opinion that the Report, with extracts from all our proceedings where it has been held in view or referred to, be with plans transmitted to the Court of Directors, before we proceed further in this momentous undertaking, for their Order and Decision, and most zealously anxious as I am, and with my whole mind bent on the execution of this important work, I am convinced that less detriment will arise to the public service from the temporary delay, than from proceeding thereon with our present means and in the present state of our information, as to the preferable site for the purpose which I am not as yet satisfied about. I am the more justified in this opinion, by the tenor of Mr Tate's own letter of the 28th October, where he points out the necessity of additional assistance in his department, being sent from Europe, and that in his report when he states, that two steam engines will be found necessary in the intended works, added to the known circumstances of the precarious state of his own health, where a single indisposition in this climate, not unlikely to befal the most healthy, would for a time put the whole to a stand, nor will, I trust, this proposal on my part be attributed to any natural disposition towards inactivity or procrastination, which I hope I do not possess, but to its real cause, the desire I feel to do justice to our employers, notwithstanding the severe disappointment to myself arising out of this delay, of necessity postponing for at least one year more, the commencement of this important undertaking, which it was my ambition to have witnessed the completion of, but which must now in all probability be for the same reasons delayed to a date beyond what my time of life and other circumstances will allow of my devoting to the purpose.

(Signed) Ph. Dundas.

To Thomas Raffles, Esquire,
Secretary to Government.

Sir,

In reply to your letter I had the honor to receive on the 26th instant, I have merely to state, that as soon as I am supplied with the enclosed list of Articles I shall lose no time in completing a fourth set of Plans for the proposed works. Having furnished three copies, I naturally concluded that the Hon'ble Court of Directors were provided for in the first instance, nor did I know to the contrary, until I received your letter.

Though free from fever, and perfectly well as to the original complaint, I am still very weak, which will be an impediment to my getting the drawings finished so soon as I could wish. In the originals I sent in, Paper No. 1, Section 1, 2 and 3, will in my opinion be the only one that will have any weight at home, and so that no disappointment can arise as to the Report being mysterious for want of plans, I will endeavour to finish in the course of 10 or 12 days two setts of drawings to which the Report refers, and if required, the rest can follow as soon as possible.

With respect to the last paragraph of your letter, desiring that I will state what new circumstances have arisen since the date of the said report, which have rendered this total change of opinions with which you were not acquainted with, at the time it was laid before the Governor and Council. Since the date of my Report the new circumstances are of the first importance and two in number. One is, that I had not the smallest idea of His Excellency Sir Thomas Troubridge quitting this station at the time I submitted my report. In addition to the aid I stated in my letter of the 24th instant, His Excellency informed me, that he had laid plans (in case my proposal to execute this most difficult part of the works should be put into a fair trial), for procuring an additional number of European Artificers, in every part of India where his influence extended to, over and above twenty to thirty skilful Artificers, Joiners and Mill-wrights he could supply on the spot. The Master Carpentar of the "Blenheim" had been in the practice of constructing Dock Gates, securing the Threshold platform &c. This skilful Mechanic, active, willing, and seasoned to the climate, with a gang of his men would have been essentially useful and every thing I wanted as to Carpenters and Smiths. Whereas His Excellency's departure from this place has left it so destitute of Mechanics, that there is not a man on the island that can weld a piece of Iron, so as to make sound work. The Admiral was of the same opinion and guarded me against this point. To any one more experienced in Mechanics, it will appear, on examining the Chain work intended to secure the base of the Coffer dam, that a single defective link might be productive of disaster. Having stated thus much respecting one reason for rescinding my proposal, permit me, Sir, to make a few observations on the second circumstance, which has occurred some months subsequen to tha date of my Report, namely, the arrival of the Steam Engine without *plan, reference or even a working Engineer* to keep it in order. On the authority of the first Engineer in Europe, Mr Watt, it will appear from the enclosure to be his opinion, that the Engine is *entirely useless*, without an experienced man to attend it and keep it in order, and notwithstanding the essential assistance His Excellency promised me, without the agency of steam to drain the foundations and clear the Coffer dam of water, I should not have ventured to have carried my proposal into execution. Therefore I beg permission to state, that there is no change of opinion on my part as to the design; on the contrary, the more I reflect upon it, the more I am convinced of its utility. The change of opinion is, *as to the means* which forms the basis, in which I requested permission to rescind my first proposition, which will, I trust, appear to be my duty to have done, for when the Hon'ble Court honored me with their confidence in sending me out, it was expected that I should report such opinions as I considered to be the truth, being the best calculated for their interest and I do solemnly affirm, that I have not suggested a single idea to the best of my knowledge, incompatible with the welfare of my Hon'ble Employers.

On reconsidering the aforestated circumstances, I confidently trust, that the reasons I have assigned (for deferring operations until suitable means are upon the spot or certain of arriving) any body of Engineers in Europe would approve, were they acquainted with the formidable difficulties I have to encounter.

I have the honor to be,
Sir,
Your most obedt. most humble servant,
(Signed) Paul Tate,
Officiating Engineer.

Fort Cornwallis, the 28th Decr. 1806.

CONCERNING THE TAN TAE HOEY IN SINGAPORE.*

Soon after Mr Crawfurd became Resident at Singapore, news spread abroad that the Chinese of the Tan Tae Hoey, who resided in the interior of the island, intended to attack the town; for those people were not a few, they counted by thousands, some of them planted black pepper and gambier and different kinds of cultivation, but most of them were thieves and robbers, and murderers, almost all of them smoked opium, and gambled to an incredible extent. They resided very far in the interior, in fact almost through to the other side of the island. They had their chief, under whom were four head men, and each of these had a punghulu, who in turn had under his orders many peons to watch the confederates, and to catch new people, in order to force them to join the society. These new people were frightened by ill-treatment, and forced to take the oaths of secrecy by drinking blood. Those who would not join willingly were punished by beating and confinement, and, if they still refused, they were then put to death.

God willing, I shall relate the history of their proceedings, as I myself went and saw with my own eyes the whole affair. I made friends with the son of a Malacca Chinaman, a member of the society, in order, by his assistance, to arrive at the secrets of the society with authenticity, as I had heard that some parts of their rules were just, while others were highly improper.

The news was spread abroad that the Tan Tae Hoey intended to come down to attack the town, and the thieves and robbers became so daring that robberies in open day became of ordinary occurrence. I enquired of my friend about these things, and he answered "yes, it is true, they intend to attack the town but they have not yet completed their arrangements, at present they have sent letters to their friends at Malacca and Pinang to ask for their consent and co-operation, and on this account the affair is delayed, but don't, my friend, tell this to any one, as I am sworn to secrecy, and, if my chief knew that I had divulged, I should certainly be put to death." I swore that I would keep the matter a profound secret, in order to get information of their real designs, for when still a youth I had heard of the Tan Tae Hoey, but had never been able to obtain satisfactory information concerning it; some told me one story and others differently, so that now I was anxious to get the correct version. I said to the Baba, "where is the place of meeting?" he answered, very far in the interior at a place called Tuah Tangling. I asked, how many men belonged to the society? he said, in Singapore, in Town and Country, there are about 8,000; there are others at Malacca, Sungie Ujong, Lokat, Lingga, and Pulo Pinang, all belonging to the same society. I said "I wish to go and see the place, can I do so?" he laughed, and then said, "what is the use of Mr Abdullah going so far, are you not afraid of being killed?" I said "I only wish to go and see, if you die, I shall die also," he then said, "very well, wait three days longer, when I am going, as there are 5 people to be admitted, and you will have an opportunity of seeing the rules of observance on such occasions, but you will have to remain there all night, and we will return to town the next morning." When I heard this an idea suddenly arose in my mind, how can I trust this fellow who is an opium smoker. How will it be if any thing should happen, as I go there of my own free will. All this passed in my mind, for with my mouth I was ready enough to answer, "very well I will go," I eagerly seized the opportunity for gratifying my curiosity. However as I had many respectable friends among the Chinese merchants in town, I informed them of my intention to go into the interior to see the campong and doings of the Hoey. They said, "at present people stand in awe of the Tan Tae Hoey, and how can Mr Abdullah go, if you are killed, whom shall we lay hold of?" When I heard this my heart beat quick, but I said, "what object could they have in killing me, what would I have with me;" they then said, "call the man who is going with you, that we may speak to him." I went to call the man, and, when he came, my friend said to him, "is Mr Abdullah going with you to Tangling Besar?" he said "yes," my friend then said, "then take great care, as if any thing happens to him we look you," he then answered, "dont be afraid, if I die, then he will die, not otherwise." Two days afterwards, on Saturday morning, at 5 o'clock, my friend came to call me, saying, "I have brought bread, and soft sugar, and plantains, so that you can eat on the road." I committed myself to God's safe-keeping, and then set out. I was dressed in an old pair of torn trowsers, an old cloth for covering my shoulders, with a torn handkerchief round my head. I had a rupee's worth of pice, a small knife, a pencil, and a sheet of paper. There were six of us, five Chinese and myself, we did not follow the usual road, but took short cuts over stumps of trees, across swamps and through water; I asked my friend why they did not improve the road, so that they might get with ease to the place. He laughed and said, "why, if the road was good we should have every one coming along—police, soldiers and Europeans; so that if there were any offenders they would very soon be caught." When I heard this I understood at once their cleverness, as it is necessary for them that the police should be afraid to go to their place of meeting. We saw parties of Chinese all along the road, some coming and some going, but I observed that my friend was acquainted with them all. Seeing this I questioned him on the subject, he laughed and said, "don't you know Mr Abdullah that I am an officer of the society." When I heard this my heart palpitated, as I began to think that perhaps he intended to betray me, and make me join the society; however I kept these thoughts to myself as I wished to find out the secret. While walking along, however, I asked him, casually, if any other race besides the Chinese could be admitted, he answered how could they, as they would certainly divulge. Moreover, if Malays or other Mussulmans, were admitted they could not believe in our God (Datu) neither could they drink spirits, nor yet blood. When I heard this my apprehensions were quieted.

---

* This amusing paper, which has been so ably and characteristically translated by our contributor T. Braddell, Esq., is taken from the "Hikayat Abdullah bin Abdul Kadir Moonshee."

A little afterwards my friend said, "Mr Abdullah, you are a little foolish now, don't speak so much but keep quiet, as we will be soon near the place, take this bundle, with the umbrella, so that I may say you are a poor Malay, come to ask alms, whom I walked along with." I answered "very well." At this time it was past mid-day, we had not reached the place, and I was hungry, I said to my friend, "I am hungry, let us eat some bread, we are near a Chinese garden, where we can stop to refresh." We walked on and arrived at a Gambier plantation. When the noise of our approach was heard, about ten dogs rushed at us to bite. My friend shouted for the owner of the dogs who came out and invited us to enter. The people of the house collected round us, and, when they saw me, they asked my friend who I was; he said, "this is a stranger, whom I met on the road, and brought along with me, he is a beggar, looking for alms." They then gave me some cucumbers and roast potatoes, which I ate, seated under the shade of a champadah tree, whilst my friend went to eat with the people of the house. While eating I observed a great quantity of arms, arranged along the walls of the house, ready for use. I counted 10 large shields, 3 iron tridents, about 20 short swords, 6 or 7 swords with long handles, and there were a great many muskets, leaning against the walls. I also saw 6 or 7 pairs of European trowsers, folded up as if fresh from the washerman. When I saw these trowsers my heart beat quick, as I thought they must have been stolen from some European gentleman. I saw and noted all these things, but thought proper to assume an air of stupidity, as if I saw nothing. At this time I wished to drink, and made a sign by raising my hand to my mouth, they brought water in a cup, but the cup was so exceedingly dirty, and smelt so strongly of arrack, that I could not drink. The Chinese now collected round me, some of them examined my handkerchief, some took hold of my beard, to all of which I submitted quietly, but with great fear, as my friend was still eating; however he soon finished his repast, and we set out again, and at about 4 o'clock in the evening, we arrived at the place of our destination. There were 3 large sheds, one of them was about 30 fathoms in length, and full of people. When we were close to this Bangsal my friend said, "Mr Abdullah keep very quiet, and assume an air of stupidity." Soon about 20 dogs commenced to bark at us, I was afraid at seeing so many of them together, but my friend called te the people in the Bangsal, some of whom came out, and quieted the dogs. The Bangsal was surrounded with a ditch, about 3 fathoms wide, and, opposite the doors, there were drawbridges, so that they might remove the bridge, and prevent people from coming over without leave. When my friend was observed 3 men brought the bridge and placed it over the ditch, so that we passed over it. On arriving at the other side there were also 2 or 3 pit-falls, over which was placed marks, but if any came, who did not know these marks, they might fall into a pit. The pits were about 3 fathoms deep, over the top was a slight wicker frame, on which dry plantain leaves were spread, and, over these, sods were laid, so as to be exactly like the surrounding ground. Some people came and led us into the Bangsal. Inside I saw hundreds of lamps, on the right and left, with people smoking opium. All round the Bangsal there were heaps of sharpened stakes, and inside arms were arranged, the sharpened stakes were used for throwing at an enemy. There were also plenty of swords, and bucklers and sticks, a fathom long, sharpened at the end like a dart, were resting against the wall in bundles.

I asked my friend quietly, "is this the place?" he said "yes, this is one place, there are 5 or 6 others larger than this, and farther inland, but to-night the people will all assemble here, as this is the place where new members are received, and Mr Abdullah will have an opportunity of seeing the ceremony, as they have just got 5 whom they intend to initiate this evening, for the Hoeys of Singapore are very bold and daring in forcing people to join their society." I then asked, "where shall we remain this evening?" he said, "I will get a place in the chamber of a friend, at one side of the Bangsal."

In the evening a drum was beaten, the sound of which was heard at a great distance, and soon after the people began to collect. In my opinion there were 500 or 600 people in the Bangsal at one time, and, of these, there were not 20 who were not opium smokers. When they were all assembled the noise in the Bangsal was such as if people were fighting a battle. At this time I was taken to the chamber at the side, which had a curtain, and belonged to the secretary. I remained here very quietly, my friend brought some rice in a plantain leaf, a roast potato, and two plantains. I ate in order to prevent me from being hungry during the night. In a short time my friend came, and said, "sit here quietly, there is a hole through which you can see, and be very careful, as the people will soon be all collected," I asked him to come and sit with me, but he said, "don't be afraid, I am an officer of the society, how can I be absent from the duty which brought me here? I will come every now and then to see you, but don't be alarmed as no one will dare to molest you." I said "very well."

About 7 o'clock they had all arrived and commenced to eat and drink spirits, which they did with a noise like battle. In about an hour this finished, when they commenced to play on drums &c., the music of which was exceedingly loud. On this they all arranged themselves in order, sitting opposite the Datu, (idol) but I observed that their faces were as red as the Bunga Rayah, from drunkenness. Among them all there was one chief, who sat on a lofty chair, with 2 men standing at his right, and 2 at his left. After them came 8 men, with drawn swords, who arranged themselves at the right and left; then came one man, who burned paper in front of the idol (sacrifice), after him came 8 men, with drawn swords, who guarded a man with dishevelled hair, and without any upper garment, in fact he had only a pair of trowsers. This man came in front of the chief, and bowed down, till his head touched the ground, the armed men on the right and left now advanced, shouting, and laid their swords on his neck, they remained silently in this position, for a short time, when a man advanced to the candidate's side; the chief then spoke as follows in the Chinese language, (this was translated afterwards at my request):—"Who are you, and from whence come you? Who are your father and mother? Are they still alive or are they dead?" These questions were explained to the candidate by the man who stood at his side, and were answered as follows:—"I am such a one, of such a country, and my father and mother are both dead," even if his father and mother were alive, he would be obliged to say they were dead, because no one whose father and mother are alive, can be admitted into the society, as the existence of all those is as if they were dead to the world and its ties. The chief then said, "will you swear that your father and mother are dead?" he answered, "I will," and performed the oath, by burning paper in front of the idol, saying at the same time, "my father and mother are dead." The chief then said "what have you come here for?" answer "I wish to join the Tan Tae Hoey." This word means the sky, the earth and man.

The chief then said "you are deceiving, your thoughts are not as your speech," answer "I will swear that I am in good faith"—"then swear," the candidate then taking paper, burned it, while he repeated his assertion. The chief then said, "are you acquainted with the rules of the society?" answer "yes, I understand that I am required to take an oath, by drinking blood." The chief then said something to which the following answer was made:—"I promise not to divulge the secrets of this society to any one under penalty of death." The chief said, "truly"—answer "truly." A vessel was then brought, containing arrack and a little blood from each of the members of the society, and, with a knife, was placed in front of the idol. The candidate then taking up the knife, made a slight cut in his finger, from which he allowed some blood to fall into the cup. The chief then said "drink in presence of Datu Peking." The candidate then drank a small cupfull, on which the chief, and all the confederates, drank a little, each in his turn. The chief then said "to-morrow go to our Secretary, and ask him for a book, in that book you will find all our rules and secret signs; you will pay one dollar for it." The chief then rose, and himself raised the candidate from his prostrate position and now being initiated, he can take his place among those who, before, would have considered him an enemy.

In this way four members were admitted, and during the ceremony, I wrote down on paper every thing which I saw going on. My friend now came to see me, and after having asked if I was satisfied, went away. After these four had been admitted they brought a man with his hands tied with a cord, he was placed in front of the chief, and ordered to prostrate himself, but he remained erect. A man then came and gave him 10 or 20 blows with a bambu, he was then asked if he would join the society, he remained silent, the question was repeated 3 or 4 times, without getting any answer. The chief made a sign to those who were armed with the drawn swords, they advanced and made a motion as if they were about to cut off his head, indeed, I thought he was killed, but the chief ordered them to desist, and again asked if he would become a member of the society, still he refused. The chief then ordered him to be stretched on the ground, and 2 men came and beat him on the back with bambus. This beating frightened him greatly, (Abdullah's illustration not translatable) but, on being questioned again, he still refused, when the chief said "to-morrow morning let him be put to death." They confined him for that night, and the next morning he was killed, in consequence of his not wishing to join the society. In this way how many tens of people have been murdered. Unfortunate people were taken with violence, at night in town, and, to increase the number of members, were forced to join the society; and, if any of them dared to divulge the secrets, they would be put to death without mercy; they could not escape, as, wherever they went, they would meet members of the society.

Each member, when he enters, gets a book, in which are written the rules and regulations, and secret signs, and marks of knowing each other, in eating, and by the different ways of wearing clothes, so that when one arrives as a stranger in any country, he can easily make himself known to his brethren by these signs, but it is not necessary for me to enlarge on this subject at present.

By the time the occurrences which I have described above were finished, it was 2 o'clock in the morning; they then blew a horn, and the people separated, some went to smoke opium, some to sleep, and some went down to town to rob. My friend soon came to look for me, and, seeing me, asked if I was not asleep, I said "no, I don't feel sleepy," but God alone knows howfrightened I was. My friend sat down beside me, and explained every thing which had happened. He told me further that there were 200 men who had gone down to town in search of food, (to rob). When I heard this my fears increased, my heart palpitated, and I wished for day-light, so that I might leave this ill-omened place, where I remained in fear. The outer chamber of the house in which I staid was crowded with Chinamen, engaged in gambling, and 2 or 3 times serious quarrels broke out. I said to my friend "to-morrow morning before day-light we had better set out," he answered "very well." While sitting thus I felt as if my eyes were starting from my head, and I threw myself down on the bed. Afterwards, at about 4 o'clock I heard a noise, as if of a number of people outside, I wakened my friend, and asked him, what was the noise, he said, "keep quiet, Sir, those are the people who went to town last night, they have returned." When I heard this I felt as if I should die with fright, and prayed for day-light. Soon after day dawned, and I wakened my friend, but he did not want to get up, he said "wait a little longer," I said, "no, this is a good time for us to go, let us go before the sun rises." At last he got up, and said, "shall we eat first," I said, "no, we can eat at the Gambier garden of the Chinaman, where we stopped yesterday," as I was only too glad to get away from the horrid place. My friend then went to see his chief, but I dont know what they spoke of, during their short conversation. When he came back I asked him what he was talking about, but he said "oh! it was nothing." This was the only thing kept secret from me, every thing else he explained, and interpreted for me, as I have written it down above.

We then set out on our way home, and my friend said, "do you know, Mr Abdullah, the people who went to town last night all had their faces blackened," I said "why did they do that?" He replied in order that they might not be recognized. "Whose house did they go to, and what did they get?" He said "you were so pressing to get away that I had not time to enquire, and besides the people were all asleep." I thought to myself, oh God when shall we get back to town. I cannot express how much I repent of having undertaken this work, but what can I do now, the thing is done. We walked on and, at about 11 o'clock, arrived at the plantation of a Chinaman, where we stopped a short time, and again set out. Concerning the road on which we walked, I shall not write about it, nor can I bear to think of it. I never in the course of my life saw such a bad road, sometimes I sank up to my thighs, and 6 or 7 times I fell down; my friend was equally unfortunate. I was astonished to think how those robbers, who went up and down this road at midnight, in dark nights, could possibly get along. God only knows how they managed. I thought, within myself, that I would willingly give ten dollars to be carried instantaneously to town. In this way we got on till at 3 o'clock, with the help of God, we arrived safe in town, but hungry and weary.

Sure enough, on arriving in town, I heard that about 200 Chinese had come down last night to Campong Glam, armed, with their faces blackened, and with tens of dammar torches, like a procession. They robbed the house of the Roman Catholic Padri. The Padri had no one in his house but the cook. The robbers divided, some watched in front, and some behind, while some entered the house. They found the Padri asleep, one man held his hands and feet, while two others placed their swords at his neck, and demanded the key of his box, the Padri pointed out the keys, they opened the box and took all his property, a quantity of money and his clothes. By the time they had finished, those on guard in the street blew their horn, when they all went away into the interior, except those who held the Padri, they remained with him till their companions had got off some distance when they also left him.

After I returned I could not remain satisfied till I informed Government of what I had seen and heard, accordingly I went to Mr Crawfurd and told him every thing as related above; when he heard me he was astonished, and said, "how could you think of exposing your life to such danger? it is a wonder you were not killed." I said, "if I had not done so there would be no certain information, as there are different accounts of the Tan Tae Hoey, but now, having myself seen things, there can be no mistake," he said, "that is very true, it is exactly the idea of Europeans." He then said, "and so there was a robbery last night, at the Roman Catholic Padri's house, in Campong Glam." I said "yes, I heard so, but how can you remain quiet thus, the next time your own house will be attacked"—he said, "that is true, but I think the road is too difficult to send people to catch the robbers, and, on that account I remain quiet, but I will send a Constable and some peons to look out for them." I said, "that is right, if you remain quiet, they will become bolder." I then made my compliments and left him, he went to the Police Office, and I went home. Afterwards in the evening I heard that Mr Crawfurd had ordered 2 Constables with 12 peons, armed with swords, muskets, pistols, and some of them with their krisses, to go into the interior, to look for traces of the robbery, and, if possible, to recover the Padri's property. They started, and, on arriving at the house half way, where I had stopped to refresh, they found a Chinaman just awakened, with his face blackened with ashes, and who was just going down to wash the ashes off, they took him into custody, and brought him to town. When he was brought up at the Police Office he pretended to be dumb, and refused to answer any question; accordingly, as it was late in the afternoon he was remanded, and sent to the prison at Teluk Ayer.

At about 2 o'clock the next morning, his friends, to the number of 200 or 300, came down armed, broke the prison and released him. Some of the rioters watched at the door, others in the streets. All the peons who were on guard ran away, each to save his own life. The Constable in charge escaped through one of the upper windows. The prison was broken, and the prisoner was carried away by his friends. In the mean time, the Constable and peons went to the Police Office, and on the roll being called, not one was missing.

When the news of this last affair spread, the people of Singapore became more terrified, each at night was occupied in watching his house, and none dared to go abroad. Now, for the first time, we heard of a night watch being set in the streets of Singapore. After this news had been abroad 2 or 3 days, the Tan Tae Hoey again came down and attacked the Dhoby Ghat and Campong Glam. There were 200 or 300 of them with dammar and bambu torches, and with arms. When the peon, who was stationed there, saw this state of affairs he ran off, and about 30 or 40 of the robbers with arms, were set to watch the ends of the streets, and the rest commenced to break open the doors of the houses, and collect the property of the Dhobies, the clothes entrusted to the Dhobies to wash were also taken. The owners of the houses were tied up to a post, and made to give up the keys of their boxes, and all the property worth taking was carried off, and not one of the neighbours dared to open the doors of their houses, to see what the noise was about. One door was opened but two of the man's fingers were chopped off, and he quickly shut the door, and kept himself quiet in fear. The robbers chose certain houses, some they passed over, and indeed they did as they pleased. After a time those on watch sounded the alarm, when they all retired, except those guarding the doors. Where three guarded one was left behind, and where there were 4 two were left; when the main body had got off some distance they again sounded the horn, when one man only was left at each door, and afterwards on another sound, these in turn ran away. When the people in the houses found that every thing was quiet, and that there were no more sounds of people outside, they commenced, but with great fear and caution, to open their doors a little way, and to slack off the bars, thinking if there were still any of the robbers about, they would feel them, but not being molested, one at last came out on the street, and commenced to scream out, on which the others all came out in turn with torches and arms. They went first to the houses which had been attacked, they found the owners of these houses tied up to posts, and all their property scattered about, their boxes all open and lying in a confusion indescribable. They released the people, and then commenced to make a noise, (quarrelling) when the peons came and pretended to make search and investigate, but God knows they were all so frightened that they wished themselves unborn.

In this way matters remained; sometimes every night, sometimes every other night, robberies were committed, till in about a week, the gun which was fired at 8 P.M. and 5 A.M. every day, was lost. It disappeared in a wonderful way;—it was placed at that time, as at present on the beach, opposite the English church; there was a sepoy, armed with a musket and regularly relieved, placed to guard it. The gun, seapoy and musket were lost and have never till this day been heard of Many were of opinion that this was also the work of the Chinese Tan Tae Hoey.

About a fortnight after that there was a large Siamese junk, which was sailing into Singapore harbour, but, as there was a strong head wind, the junk was anchored outside at Tanjong Katong. One night the Tan Tae Hoey came in great numbers in boats and boarded the junk; they attacked and killed many of the crew, and the rest jumped overboard. The pirates then collected all the portable things, and loaded their boats as deeply as possible with them, and set off home, going round by the back of the island of Singapore. Of all those of the crew who jumped overboard, only 4 were saved. When they got on shore they went at once to the Police Office, to make their complaint. The Magistrate sent some peons to the junk, to examine into the truth of the report. They went, and sure enough found 6 or 7 corpses lying about with cuts and stabs, and already decomposing; the junk also was daubed over with blood; the cargo also lying tumbled about in great confusion; the chests were all broken open and the contents gone. The junk was ordered to be brought into the harbour, and a guard of peons left in charge. They afterwards commenced to make enquiries and tried to find a trace as to who had committed the piracy, but they enquired to their hearts content, during a whole month, in which the junk was detained, and no clue was obtained; when the junk was delivered up to those of the crew who were saved.

I shall not enlarge further on the conduct of the Chinese Tan Tae Hoey in Singapore, they were exceedingly licentious, and did as they pleased, without regard to decency, or civilized manners. How many lives of the servants of God, how much property, did they unjustly take, there were hundred of houses robbed, which I have not noticed, indeed I have only given a very slight idea of what they did. Nevertheless the great men who governed the country, remained quiet, satisfied with their evening drives, their well covered tables, their well lighted houses, and their salaries of thousands of dollars every month, they allowed the Chinese to tyranize over an English country; in this way the Company's property is wasted, in paying salaries only. I know in other places, in Malay, Arab, Chinese, and different countries, that robberies, and thefts, and murders, are committed, but at that time, in Singapore, an English settlement, the Chinese were permitted to take the Government of the country into their own hands, and to rob, skill, as they pleased. While musing on this subject I was suddenly startled by the firing of the morning gun. I began to think seriously, whether or not the Chinese were allowed to behave in this way, because there was no road by which the Europeans could take their soldiers into the interior, to put a stop to the Chinese Hoeys by force? and I arrived at the conclusion that that was the true reason of the Company remaining quiet, otherwise they would have destroyed the Chinese long ago. However, at that time, Mr Crawfurd commenced to make a road into the interior, but as there were very few convicts then at Singapore, the work proceeded slowly.

THE

JOURNAL

OF

THE INDIAN ARCHIPELAGO

AND

EASTERN ASIA.

REPORT ON THE GEOLOGICAL PHENOMENA OF THE ISLAND OF LABUAN AND NEIGHBOURHOOD.

By J. MOTLEY, Esq.

THE island of Labuan on the N. W. coast of Borneo, and now a British settlement, is, in shape, a sort of triangle, of which the longest side, running about N. E. and S. W., is 11 or 12 miles in length and approaches a straight line. The coast line is, for the most part, flat and sandy, although in one or two places low cliffs abut upon the sea and at about the centre a sloping cliff, 100 feet high or more, leads out to a long sunken ridge of rocks, terminated by a rocky islet named Lyang Lyangan. At this point deep water may be found up to the beach, but elsewhere shoals and coral reefs extend to a great distance from the land. The southern side, of about 6 or 7 miles in extent from E. to W., is indented by a broad bay having for the most part very shoal water, from the bottom of which a considerable stream, the China river, pursuing a very tortuous course through mangrove swamps but in a general N. and S. direction, divides the island for about ⅔rds of its length into two nearly equal parts. Victoria harbour may be considered a part of this bay, for it is probable, though not certain, that the mangrove swamp at its head is continuous or nearly so with that bordering the China river, so as to separate the range of low hills on the west of the harbour from the rest of the island. From the opposite sides of this bay two ridges of hills, probably nowhere more than 200 feet in height, converge towards the head of the China river, the most elevated parts probably occupying about the central lines of the two divisions and forming the water-shed between the central mangrove swamps and the ravines of the eastern and western shores. Besides the main central drainage of the China river, there are upon this coast several minor creeks, dignified by the name of rivers, which penetrate but a short distance into the jungle.

The dependant islets of Labuan, with the one exception just mentioned, all lie to the south, and proceeding from W. to E. are as follows:—Pulo Kuraman, consisting of a long low ridge and a good deal of sandy beach, is about 1½ miles in length and is situated a little to the S. W. of Tanjong Kiamsam, the west point of Labuan. Eastward of it is Pulo Burong, opposite the mouth of the China river, a round mass of limestone rock about 50 or 60 feet high. Off Tanjong Rancha Rancha to the west of Victoria harbour is Pulo Belulang, a small limestone rock, and south of it is Pulo Enoo, a small hill surrounded by extensive sandy tideway. On the east of the harbour entrance lies Pulo Kulin Pappan, a small ridge with sandy beach on each side, and connected by a line of rocks, for the most part sunken, with Pulo Daat, which is the largest of the islands, being 4 or 5 miles in circumference, and containing several hills 80 or 90 feet high. Still eastward and in the mouth of the Kalleas river, passing over an island named Labungan, is Pulo Malankassam, which by some mistake in the naming of the early charts was ceded without the intervening island. All these islands are nearly in a straight line. To the southward of Kuraman are Oosookan Kichil and Oosookan Besar, rocky islets with a little flat sandy plain and surrounded by very foul and dangerous ground.

The eastern side of the island forms also a shallow bay almost filled with coral reefs and sand banks, and partially fringed with mangroves. Towards the north another smaller river, the Gangarak, drains a considerable extent of country, chiefly swampy, producing a luxuriant vegetation of various palms and mangroves, and the greater part of it hardly elevated above the level of the sea. Its sources are, for the most part, to the southward of its debouchment, though one small branch runs in a northerly direction, and they are divided from those of the China river by the united northern extremities of the two ridges before mentioned, which are here, for the most part, very low.

A ridge of sandstone hills, in some places upwards of 300 feet high, commences at Kubong Bluff in a cliff of some 80 or 90 feet in height and crosses the island in a S. S. West direction to Luke point or Sawangan Pagai on the western side, forming the cliff previously mentioned. A second ridge, less regular, though in places even higher than the first, commences at Tanjong Kubong a few hundred yards to the N. and runs parallel to it. Between these two ridges are the argillaceous strata containing the principal coal seams of the island.

The island contains therefore a large district of swampy land covered by mangrove and nibong palm, which occupies the central parts of its southern side and penetrates, in a wedge-like form, nearly or quite to its centre; and a second similar, though smaller, swamp, which commences on the eastern side a little to the north of Gangarak, runs in a S. W. direction to a point a little north of the head of the China river, from thence in a curve north and east to a point about one mile south of Gangarak, whence it skirts the coast in a narrow belt for a mile or two to the southward. These swamps contain a few small patches of drier and more elevated land, generally of the same alluvial formation, and on a rough calculation probably occupy about one-ninth of the whole surface of the island. Though now almost impassable and probably unhealthy, these rich alluvial flats will eventually be very valuable land. The remaining surface of the island may be described as of three varieties of soil. The first, occupying at least three-fourths of the whole island, is a fine and deep yellow loam, excellently adapted for nearly all tropical cultivations, and from a pretty constant mixture of sand and hard particles of oxide of iron, not liable to become so hard and parched in the dry season as commonly happens to most of the soils of India. This soil, the debris of the shales and clays of which the measures principally consist, forms the covering of the numerous broken spurs, intersected by a perfect labyrinth of water courses, of which the island principally consists and the ever recurring irregularities of which, hidden as they are by dense and heavy jungle, render walking excessively fatiguing, and every sort of surveying extremely difficult. A few only of these watercourses carry any stream in the dry season, except to the north of the beforementioned sandstone ridge, a tolerably regular supply of water springing from the coal measures. All the main streams run pretty uniformly towards the N. W. to debouch on the W. side of the island.

The remaining varieties of soil are the sandy plains of elevated beach with abundance of recent shells and corals which are found here and there along the coast, the most extensive being that on which the town is intended to be built to the north of the harbour, and some tracts of peat and white sand exactly similar to those found upon hills of sandstone formation at home. Of this soil, (the only one which is really worthless) the greatest extent is at the S. E. angle of the island, being there about a mile in width and extending some 2 miles along the eastern shore in an irregular band. This valueless tract is in great part cleared, and upon it are built the houses of the Government officials. It is, however, swampy, unproductive and in every respect unfit for that purpose. Similar tracts, though of a drier nature, are found here and there on the summits of hills and projecting points where the sandstones approach the surface, but they are, with this one exception, of very small extent.

The measures of which the whole island is composed are alternating clays and sandstones, with all the intermediate modifications usually found in an English coalfield, but having throughout the appearance of having been exposed to much less pressure and condensation. Coal occurs in several places, and the veins appear to be associated in groups. In one place 5, in another 3 veins (one very small) are distributed in a very small space of ground, and in each case the containing group of clays is placed between two very thick beds of sandstone. The clays are usually very slightly laminated, excepting where they are alternated with sandstone in excessively thin beds, a formation rather common. They are also much less carbonaceous in general than the corresponding members of the Welsh and north of England coal fields, but to this there are some exceptions. One bed of blue shale, apparently of considerable thickness, yields in several places small springs of dark coloured but tolerably pure petroleum. This bed is in perpendicular depth some 400 or 500 yards below the principal coal seam. I have detected no regular beds or veins of ironstone, though the clays frequently contain nodules of argillaceous iron ore, sometimes in nearly continuous courses. These nodules are often septarian, and are filled with crystallized but very friable carbonate of lime. Small masses of arsenical pyrites are also sometimes enclosed in them, as well as in the clays themselves. These nodules when exposed to the air, appear, in the course of a great length of time, to become converted into a red oxide of iron of various degrees of hardness, from a powdery yellow soft substance, to a dense dull purple cavernous stone of vitrified appearance, capable of striking fire with steel and closely resembling the laterite of Singapore. The whole surface soil of the island and the beds of most of the streams are more or less covered with scattered masses of this substance. It is also found on the main land, and is the ore from which the Kadyans and Mooruts, native tribes in the neighbourhood of Brune, manufacture thin iron.

The sandstones are, for the most part, friable, sometimes so much so as hardly to bear handling. There are however some beds of fine hard freestone. Though soft, they are tough, and very difficult to quarry, resisting blasting in a most extraordinary manner. They frequently contain very imperfectly rolled pebbles of coal and shale. In one or two places a very coarse conglomerate occurs containing pebbles the size of an egg, cemented by excessively hard silex and dark oxide of iron. At one point on the beach, north of the crops of the principal coal veins, a considerable quantity of titaniferous iron sand occurs. Whenever the sandy beach is removed by a high tide or heavy rains, it appears to ooze out of a bed of sandy clay forming the low shore, but whether alluvial or in its regular series I have been unable to determine.

The coal is of very good quality, hard, dense and with a fracture inclining to conchoidal and is remarkable for having dispersed through its substance masses of imperfect amber, sometimes light yellow and very transparent, sometimes approaching to black and in a semicarbonized state, but always extremely friable and brittle, when burnt it diffuses the fragrant smell of recent resin, and is in a sufficiently perfect state to be collected by the workmen and used with fresh dammar in making torches. In some seams of coal on the river Bintulu, to the south of Brune, I have been informed by the late Mr Burns that almost half the seam consists of this substance, which is there commonly dug and used by the inhabitants as dammar.*

The following is an example of the measures of Labuan, from actual measurement at Tanjong Kubong, in the ascending series going northward from Kubong Bluff:—

1.	Blue shale with indistinct traces of shells		
2.	Coarse white sandstone	10	..
3.	Very coarse conglomerate of quartz, coal, hard red sandstone, white do, and pebbles of hepatite cemented by siliceous oxide of iron	3	..
4.	Sandstone	12	..
5.	Sandstone with abundant particles of coal and quartz pebbles	4	..
6.	White sandstone, with pebbles of coal, sandstone and blue shale, the latter still containing traces of vegetable organic remains	21	..
7.	Hard, reddish sandstone	1	61
8.	Hard, close, white sandstone	9	6
9.	Conglomerate of quartz, sandstone and coal pebbles, cemented by very fine white sandstone, very various in texture	30	..
10.	Blue clay	1	6
11.	Coaly earth	0	6
12.	Sandstone, in the lower beds of various qualities, from fine free stone to coarse grit and containing many particles of coal, in the upper bed greyish white and very hard, rising in large blocks	47	..
13.	White clay vein	0	2
14.	White soft sandstone	4	6
15.	Hard blue compact clay, with occasional nodules of iron stone	3	6

---

* Some specimens in our possession of coal from Ri'eh, on the east coast of Sumatra near the Indrageri, contain much of this substance.—Ed. J. I. A.

16.	Very hard blue sandstone	0	6
17.	Laminated sandy shale	1	10
18.	Very tough blue clay not laminated, rapidly falling in the air	3	3
19.	Brittle laminated carbonaceous shale	0	3
20.	Coal, very dense, like cannel coal	0	4
21.	Soft, rather coaly, fire clay, with no stignariae, but small nodules of ironstone	3	..
22.	Coal, main seam	11	..
23.	Hard carbonaceous shale, often running out	3	..
24.	Blue clay, hardly laminated, with occasional nodules of ironstone and pieces of carbonized wood of dicotylidons, and silicified stems of palms, impressions of leaves and 1 species of (?) fresh-water bivalve shell……say	60	..
25.	Coal……about	1	6
26.	Blue clay with ironstone……about	50	..
27.	Coal……about	1	2
28.	Blue clay……about	0	6
29.	Sandstone		

Above all these is another series of sandstones similar to those below the carboniferous clays, about the middle of which occurs the remarkable feature of a tolerably continuous, though not quite regular, course of large waterworn blocks of coal, some as heavy as a couple of hundred weights. They lie sometimes in groups, sometimes several yards apart, and I have traced them in several water courses across the island. A short distance above these rocks is another small vein of coal, occasionally divided by a narrow band of stone. Of the three last mentioned veins none exceed 18 inches at the place of this section, though the first shews a thickness of nearly 5 feet at one point inland. Of the rocks and islets about Labuan two only vary from the mineral composition of the island, namely, a small rock between Pulo Enoo and Tanjong Rancha-rancha, which consists of a very compact bluish, white stratified limestone, with irregular veins of reddish argillaceous limestone and crystallized white carbonate of lime, and the island of Pulo Burong, opposite the mouth of the China river, which merits a somewhat detailed description. Its material is a rough coarse amorphous cellular limestone, mechanically mixed with abundance of particles of siliceous sand which are left behind when the mineral is treated with acid. The rocks are very picturesque in their forms, overhanging their bases and pierced by numerous caves, some of which are of considerable size and pillared with fantastic powdery yellowish stalactite. The south-east corner is moreover divided from the rest of the island by a deep fissure 8 or 10 feet wide, appearing as if the mass of rock overhanging its base had, by its own weight, separated from the main mass. The rock varies in density, hand specimens might be procured as hard and close as marble, or almost as cellular as pumice, but no quality unmixed seems to occupy any great space; throughout the whole there is no appearance whatever of stratification. My friend, Mr O'Riley, who has seen similar rocks in course of formation in Java, told me that he considered this island to be a tuff or calcareous spring formation, and my investigations having been guided by this hint, I now feel convinced that such is a proper explanation of this singular mass of rock, though no trace of any spring, calcareous or otherwise, is now to be found here. I am informed by the natives that similar rugged and cavernous masses of limestone rock exist in several places on the mainland of Borneo. Probably the agglutinated masses of sand and broken shells, which form in many places on the Labuan beaches complete beds of hard and compact rocks, may owe their origin to springs, highly charged with carbonic acid, percolating through the shelly sand and dissolving and redepositing part of the lime it meets with in its passage. I have a recent shell picked up in digging a foundation on the sandy plain at Labuan whose cavity contains crystals of carbonate of lime. The measures upon the coast of Borneo as far to the N. as Mengkabong (and probably further, though of this I have no personal knowledge), resemble those of Labuan, and coal exists upon the island of Pulo Gaya, at Gantisau, a little to the north, where the shales are coloured of red brick hue by powdery oxide of iron, and at Mengkabong. Most probably out-lying granitic masses from the high mountain of Kina Baloo break the coast line of coal formations near the north point of the island of Borneo, judging from the outline of the hills as seen from a distance The sands of the rivers in this district afford smoky yellowish agate, titaniferous iron sand, occasionally a little gold, and (it is said) tin. The material of the mass of Kina Baloo is selenitic granite and I have seen specimens of very fine white mica, and a sort of coarse jade, stated, by the inland tribes from whom it was procured, to be obtained from masses which occasionally fall from the eastern brow of the extreme summit and by them valued as an amulet.

Mr Low, who last spring attained a considerable elevation upon the western flank of Kina Baloo, has given us no exact data for determining how far inland is the line of junction of the sedimentary and primary rocks in the course of his ascent from Tawaran, but he describes hills of materials and form very similar to those of the coal formation about Brune at a distance of one or two days' journey inland. From Kina Baloo a long range of hills, probably 2,000 to 4,000 feet high, runs apparently in a direction a little west of south. It is visible from the north point of Labuan, but at some distance inland, say 30 or 40 miles, and as far as that latitude probably forms the eastern limit of this vast coal field or of subjacent rocks in the same series. At the foot of this range I have native reports of salt springs in 5 different localities. Just to the north of Brune river and the other streams emptying themselves into the same estuary, the whole of which after reaching a very short distance inland run in a S. W. direction, or more or less parallel to the coast, an extensive tract of very high land, known to the natives as the Lawas mountains from the river which rises among the highest of them, and probably identical with the crystal mountains of the early European navigators, intrudes upon the broad belt of Delta, which fringes so much of this coast. The principal peaks of these hills are, by trigonometrical computation, from 6,000 to 8,000 feet in elevation and a little to the south and west is another subordinate group of smaller extent, but containing one peak, Mount Mooloo, of greater elevation, being, according to Sir Edward Belcher, upwards of 9,000 feet; this district, from its form, elevation and the reported occurrence of gold and tin, is probably granitic. To the south and west of this high ground is a most extraordinary labyrinth of steep hills and narrow valleys, the highest point, Mount Say, close to the town of Brune, being, by barometrical measurement, 706 feet; these are all coal formations, and several veins of excellent coal, one of extraordinary thickness, have been discovered in the district. With these hills the mountainous northern region of Borneo appears to terminate, or be divided by a vast plain from the southern ranges. I have explored the river Limbong, whose mouth is close to that of the Brune, an estimated distance of 150 miles, or in a straight line about 50 miles, in a general S. W. direction, and with the exception of a long ridge skirting the river for some distance, the country to the eastward appeared a boundless grassy plain; to the S. W., however, and at a great distance, appeared a very high conical peak which I believe must be second only to Kina Baloo.

Of the country to the south of Brune I have personally little knowledge, it is however perfectly certain that coal exists on the Barram, Bintulu and Rejang rivers, and from the upper part of the latter I have seen specimens of black mica which would seem to indicate a primitive district. At Bintulu and probably in other rivers, antimony occurs in limestone, but of what nature I am ignorant, never having seen specimens of the matrix of the vein, and at Tatau a mud volcano and a hot spring depositing some species of tufa are found also in limestone, which is described as forming rocks and cliffs of most singular forms. The shape of several hills on this coast, as seen from the sea, would lead to the idea of their being granitic, but with these exceptions the coast is probably composed chiefly of modern alluvium, being flat and low, and having the principal drainages at projecting points.

The late Mr Burns informed me that at one point on the Rejang it occupied him only about half an hour to walk from the coal to the antimony vein in limestone; they must be here very near together. Sulphuret of antimony appears to be a very abundant mineral in Borneo, it is found from Sarawak nearly to the north point of the island, and in some localities very abundantly; it seems to take the place of the correspondent compound of lead in our European limestone formations. I must repeat that all my information relative to the country south of Brune is derived from the reports of others, as with the exception of two flying visits to Sarawak, I have not landed on any part of that coast.

The measures at Labuan and as far as I have seen on the coast also, dip at a very considerable angle and generally to the north. The dip of the coal measures at Tanjong Kubong, which appears to be the most regular portion of the island, is about N. N. west, and the angle at the eastern end about 24 degrees, gradually increasing to about 70 degrees at the western extremity of the rocks at Sawangan Pagai; in Pulo Daat, Pulo Loobedan, and the opposite coast generally, the rocks are so nearly perpendicular as to make it often doubtful which way they are inclined to dip. At Brune, to the south, the dip of the rock is also nearly due north and excessively steep, as it is also at Tanah Merah, some 20 miles north of Labuan.

At Mangatal and Mengkabong, which form the limits of my personal knowledge, the dip is also northerly, but at a much easier angle. So far as these examples, taken at very distant points, would shew, the general strike of the country is about N. E. by E. and S. W. by West, its dip northerly and its inclination varying from 70 to 20 degrees, but I am unwilling to form any confident conclusions as to its axis of elevation from my circumscribed opportunities of observation, as there are many places, e. g. Pulo Loobedan, the reefs in the bay south of the island, and even a spot almost close to the most regular part of the measures at Tanjong Kubong, where the strata are contorted at sharper angles and upon smaller curves than I have ever seen elsewhere on so large a scale; a trip to the foot of the Lawas mountains would probably throw much light on the formations of the whole district. The vast number of small springs upon the island during the wet season is remarkable, though but few of them are permanent, with the exception of a very regular range quite across the northern end of the island, springing from the lowest edge of the clays under the coal, where they rest upon the thick sandstones, and another less copious but equally permanent range immediately above the second sandstone series. These are all highly chalybeate and most of them give vent to a considerable quantity of hydrogen gas, in the lower range remarkably pure, in the upper generally sulphuretted; a considerable quantity of hydrogen also occurs at the springs of petroleum. Probably connected with the phenomena of springs is the occurrence all over the more argillaceous parts of the island, but more especially in the exceedingly broken ground north of the plain on which the town is located, of numerous scattered funnel-shaped sink holes, similar in shape to those common in some limestone districts in England, especially in Brecon and Carmarthenshire; here however the bottoms of these holes are usually covered with earth instead of loose stones, but the water nevertheless passes away pretty freely. I have never seen them full after the heaviest rain for more than a few hours.

I have seen but one fault, properly so called, in the district; it is visible in the beach nearly at the north of the island, on the western side, it has a dislocation of about 2 feet only, and crosses the measures nearly at right angles. Rolls and contortions as above stated are abundant and extensive, and changes of dip very common. The description in the last chapter of Captain Mundy's book of a "dyke of inflammable rock" near Brune in the Kiangi valley has certainly originated in some mistake;—the rocks alluded to are the usual friable sandstone of the district tilted up nearly on edge. So far, then, as the mineral constituents and general conditions of the measures of this coal field are concerned, it differs but little from those of England and Wales, except in the usually friable state and slight cohesion of its siliceous members and its much less proportion of ferruginous ingredients, but however similar in appearance, the organic remains contained in these rocks would appear to indicate a different and much later era. All the fossils I have yet been able to discover are either testaceous or vegetable remains, with the exception of a solitary specimen, regarding which I am in doubt whether it is a fragment of a small echinoderm or part of the bark of a crab.

The fossils are tolerably abundant in some beds both of shale and sandstone, though not by any means to be found in all, but are usually in extremely bad preservation. The first deposit I shall notice is a bed of light brown, very soft and fine grained sandstone, in places very argillaceous, it crops out through the boggy soil at the south-east corner of the island, forming a perfectly barren strip of rock quite level, and not elevated above the adjacent surface on its lower edge, and on its dipping side sloping down to similar soil a few feet lower; though so soft and apparently decomposing with ease, it appears quite incapable of sustaining any vegetation; I never crossed it when the sun was very hot without perceiving a strong and most unmistakeable smell of iodine, it is divided by partings of extremely small fragments of broken shells, so comminuted as not to be recognizable, into beds of from a few inches to 2 feet in thickness, and it is generally here and there in these partings, through sometimes also in the mass of the rock, that the few more perfect shells are to be found; the calcareous part of the shell usually remains, but in a soft and pasty state, peeling and crumbling off in drying. I have procured, or rather seen, a vast number of specimens, for very few could be carried away from the excessively friable nature of the matrix. —The following is a list of what I have been able to identify as distinct species:

Pyrula	1
Turbo?	1
Cerithium	3
Fusus	1
Oliva	1
Terebra?	2

Univalves 9 Species

Arca	1
Solen	1
Terebratula?	1
Of undistinguishable genera	7

Bivalves 10 Species

Along with these are leaves closely resembling those of the common mangrove, fragments of wood, traces of? fucus, tracks of crustaceæ and borings of annetides. After an examination of these deposits, and of what is going on before our eyes, not a mile distant, we can have little hesitation in describing this as a littoral tidal deposit, in some shallow sheltered bay, differing in nothing except in the species of its organic remains from thousands of acres yearly in course of formation on the coast of Borneo, and even on the shores of Labuan itself. About half a mile northward of this deposit, a thin bed of sandy shale is exposed in a low cliff on the beach, consisting almost entirely of impressions of two species of Pecten and an Ostrea or Avicula, but so extremely brittle that I was unable to secure any specimens. So far it is to be observed, the fossils noticed are, with the exception of the leaves, exclusively marine. From this spot, which is near the brook called Mombedi, the coast is low and muddy, affording no sections until arriving near the South Bluff of Tanjong Kubong, a distance of about 5 miles. At this place a bed of shale, underlying the thick mass of sandstones under the coal, is occasionally to be seen when rough weather has removed the superincumbent mud and sand. It contains abundance of fragments of shells in a very imperfect state, they appear however all to belong to one species of small bivalve, nearly orbicular and very thin and smooth. This bed of shale, including many extremely thin layers of very argillaceous sandstone, is of great thickness, probably 50 or 60 yards, the sandstones immediately above it have all the appearance of a fresh water deposit being very irregular in their texture even in the same bed and at a distance of a few yards; they contain abundance of water-worn pebbles of red and white sandstone, quartz, hepatite, ironstone, coal, and even blue clay, often still showing traces of vegetable remains, and not unfrequently semi-carbonized fragments of wood.

The coal, dense and perfectly carbonized as it is, yet exhibits most unequivocally its vegetable origin, and not only that, but even the kind of vegetation of which it has been composed, is evident from the most cursory inspection of the heaps of coal brought out from the levels. It is clearly the product, not of a bed of peat produced by the decay of small vegetation, but of a mass of huge timber. At least one-half of the mass displays the grain and structure of wood, and frequently it separates naturally into the concentric layers of decotyledonous wood. All the specimens I have examined (i. e. by placing the ashes under a microscope, for I have not the apparatus necessary for cutting thin enough sections of so opaque a substance as coal), have exactly the structure of the dipteraceous trees now forming the mass of the timber growing above them. The trees must have been of vast dimensions. I traced one trunk upwards of 60 feet and for the whole of that distance it was not less than eight feet wide. They are all prostrate and slighty compressed, and lie crossing each other in all directions; what makes the resemblance of this coal to the wood of the dipteraceoæ still more striking, is the existance of the thickly scattered masses of semi-transparent resin, dispersed through its substance, which I have previously noticed. I have once or twice seen what appeared to be rolled pebbles of coal, embedded in the substance of the vein. The clay below this coal contains a few carbonaceous particles, but no traces of stigmariæ, or any other forms of fossil roots. In the shale above the coal are found occasionally erect trunks of small size, apparently, from the coats of thin bark, decotyledonous, but their whole substance converted into soft pulverulent coal, and more rarely, palm trunks, also erect, but solicified and excessively hard; impressions of leaves are in vast abundance, though rarely perfect. I have procured identifiable specimens of nine species of decotyledons, of which two so closely resemble existing species of Baringtonia, and a probably dipteraceous plant which yields an oily resin, named druing, much used for protecting wood, that it is difficulty to believe them not identical. Two or ? 3 species of ferns, a large flag shaped leaf like a crinum, and something closely resembling a large thick stemmed usnea or confervoid alga; besides these, I have seen, but always too large to be extricated as specimens, 4 or perhaps 5 species of palms, one flabelliform and four pinnate, one of the latter very closely resembling an existing species. These vegetable remains are chiefly, but not entirely, in the lower part of the stratum; sparingly among them, but more abundantly in the upper half of the thickness of the bed, are found a good many casts of bivalve shells much like some species of unio, the calcarcous part ot the shell is universally removed, but the membranous epidermis appears to remain, generally as a sort of varnish upon the cast, but occasionally floating freely in the cavity formerly occupied by the shell. The casts are of ironstone and are usually deeply fissured like septaria. I have never seen one come out of the matrix perfect.

I have not yet been able to discover any remains of fish, reptiles, or cypris, although I am always on the look out for them.

I do not know whether any organic remains exist in the shales accompanying the other coal seams, as I have had no opportunity of examining them minutely, although there is no apparent change in the mineralogical or mechanical structure of the rocks, going north from the group of coal veins, except that the sandstones are perhaps a little harder and more consistent; yet at the distance of about 1,500 yards occurs another pretty large deposit of marine remains, consisting of shells and what I suppose to be algæ, in the form of narrow carbonaceous ribands, intersecting the clay in every direction. This deposits consists of a bed of unlaminated blue shale, divided by several bands of very hard siliceous indurated clay, full of nodules of siliceous ironstone, hard enough to strike fire from a pickaxe. In the shale the shells retain their calcareous substance, though in a very decayed state, so as to be with very great difficulty extracted in any thing like good preservation. As far as I saw they are all bivalves and I distinguished the following species:—

Cardium	2
Tridacna	1
Arca (different from the former)	1
Ostrea	1
Tellina?	1
Uncertain	4

In all 8 species bivalves.

In the hard bands I procured some of the same species with others and some univalves, but in most cases they were mere casts, the calcareous matter having disappeared. The species I was able to distinguish were as follows:

Murex	1
Turbo?	1
Serpula	1
Cerithium or Terebra	2
Univalves....	5 species.

Pecten	1
Ostrea	1
Uncertain	2
Bivalves....	4 species.

An almost exactly similar formation to this bed of shale, and containing very similar fossils I observed in the bed of the Tukuruk river near Brune.

Upon a review of all these facts, it is impossible not to be struck with the remarkable difference in the phenomena of this coal field and those of similar districts of Great Britain. Here are no vast dykes and faults; so far as is yet known no sauroid fishes, no stigmariæ, sigillarrii, calamites and lepidodendra, no aminonites, gryphaece, or other ancient forms of shells, as in the few marine beds of English coal fields; but on the other hand shells and plants of recent forms and families, rocks which have evidently been subjected to very slight compression, in general remarkably friable and wanting in cohesion and entirely free from that semi-vitrified appearance and almost conchoidal fracture so common in England, in the Pennant rocks, and in many of the thick sandstones of Yorkshire; in fact just such a state of things as is now probably in progress at the mouths of many of our large Borneo rivers; for example, in the great estuary, between Labuan and the mouth of Brune river, I have no doubt that an almost exactly similar mass of clays and sandstone must be forming very rapidly; the natives say that they grow padi where their fathers caught fish, probably a slight exaggeration, but shewing that they are well aware of the change which is in progress.

The island laid down upon the old chart of Dalrymple under the name Pulo Pusaria is now no longer an island, nor even is it called so. It is connected with the main by a neck of low land and its style and title altered to Tanjong Sari Besar. Even in so short a time as has elapsed since the beautiful and elaborate survey made by Captain Gordon, the depth of water is in several places less than that laid down upon his charts, of whose original accuracy there can be no doubt; the mud and sand forming the materials of this accumulation bear, as has been before stated, a very close resemblance to those of which the measures of Labuan must have been composed, with the exception of the conglomorates of large pebbles, which I have not seen represented in the modern deposits, but which must nevertheless exist in rivers running from a mountainous country, but are probably from their superior gravity left at the head of their extensive Deltas.

The remarkable and peculiar feature, however, of these formations, is the very constant and frequent occurrence in its clays and fine grained sandstones of materials, which lead us to the conclusion that this coal field, vast as it is, is formed in part from the debris of some more ancient series of carboniferous measures. Different as are the remains of organic life from those found in our English coal fields, and strongly as they point towards a more modern era, as the heyday of those mighty amber-embalmed trunks which form the coal of Labuan, and compared with some of which the huge forest monarchs now striking root into their graves must be pigmies, yet although the vegetable remains found in the Burdwan Indian coal field are said to bear in botanical character, a strong resemblance to those of Europe; we know perhaps as yet too little of tropical fossil botany to conjecture with any degree of certainty their geological date, still when we find embedded in these measures waterworn fragments of coal, and pebbles of clay, containing carbonaceous marks which must have formerly been vegetable substances, we must be convinced that whatever be the age of the strata now under consideration, there must at all events have been another series of similar rocks undergoing the process of abrasion at the time of their formation, and furnishing at least a portion of their materials. Nor can these materials from their condition have travelled any very great distance; coal being brittle and soft bears very little waterwear, I have seen it reduced to the form of round pebbles by two days washing on the beach, and in a running stream it is soon reduced to powder. I suspect that it would be difficult to find a coal pebble at a distance of half a mile from the vein in course of abrasion in any moderately rapid stream, shale will certainly not bear much violence, but the fragments of shale in these measures are evidently waterworn, and yet contain traces of their former fossils, proving that they are true pebbles and not the rolled masses of clay abundant on beaches bounded by clay cliffs, as on the coast of Holderness. The embedded pebbles of sandstone too are for the most part very similar to their matrix, and of the perishable nature of this last I have ample testimony in the absolute disappearance in about 2 years of at least one-half of the stones thrown down to defend a bank of earth from the sea, and the reduction of the rest from large angular fragments to small boulders.

The coarse beds of conglomerate mentioned above, are, however, composed of very different and probably much more ancient materials, and these, hard as they are, bear witness to a long and severe trituration, being in general rounded, and perfectly smooth. The pebbles consist of Hematite Quartz and very hard, dark-red sandstone, intermixed with nodules of ironstone, and some fragments of the softer materials described above, cemented by a very highly ferruginous and excessively hard sandstone of a dark-red colour, frequently remaining in a cellular form where exposure to the air has decomposed the more perishable materials. These rocks do not, so far as I know, exist in situ anywhere in this neighbourhood; the only conjecture I can form as to their original locality is from a number of specimens brought by H. M. Surveying ship "Royalist" from the island of Palawan. Among these were fragments of rocks almost exactly similar in appearance to these pebbles, accompanied by several examples of compact blue limestone, one specimen apparently highly bituminous, but I could learn nothing of the geological features of the country beyond that it was usually rugged and mountainous with bold rocky coasts.

Although it may be presumptuous in a mere observer like myself, to set up for a geologist by hazarding conjectures, yet it is perhaps worth while to do so, if only for the sake of inducing some one more competent to set me right where I may be manifestly in error, and in this account I am induced to propound my theory of this coal field as follows:

It appears probable, in the first place, from their organic remains that these measures may be coeval (giving to the word a wide interpretation) rather with European tertiary formations, than with those secondary ones in which our northern carboniferous series of rocks is found, and the more so, because there so considered strata contain internal evidence of the existence of similar rocks, whose age had already become geological at the date of their formation.

Secondly, the exclusively siliceous and argillaceous general character of the rocks and the absence of mica would lead to the belief that they were formed rather from the debris of secondary than primary strata, an opinion confirmed by the occasional occurrence of apparently secondary pebbles.

Thirdly, the identity of some of the constituents of these beds with rocks from the north, is, so far as it goes, presumptive evidence of the water power which carried these materials having been exerted from that quarter.

Fourthly, the absence of faults, properly so called, seems to demonstrate that the present very steep dip has been owing to one, rather than many repeated, elevations, and at the same time the excessive contortions without breach of continuity of the bed, would suggest that this elevation was a sudden and violent convulsion rather than a gradual upheavement.

Fifthly, the rocks have none of them the appearance of having been exposed either to great heat or very extreme pressure, and

Sixthly, that the axis of the elevation causing the present dip must probably have been in a direction more or less N.E. and S.W. or pretty nearly in the direction of the range of hills visible in the interior of Borneo, the northern extremity of which, Kina Baloo, is know to be granitic. Is it not then probable that this vast coal field of Borneo may be the ancient estuary of some immense river or perhaps system of rivers (such as on a small scale now exists along much of this coast of Borneo)? Here a vast number of small streams are continually and rapidly forming deltas in a shallow sea, whose depth is to be measured by tens, and not as in other seas by hundred and thousands of fathoms, and must of necessity as their deposits extend frequently join, and thus lessen the number of mouths, by which their waters are discharged. As the streams in each individual channel thus become more powerful the debris will be carried further and further to sea, the same causes which operated to unite the smaller streams will have a tendency in course of ages to bring all into one great river, and taking into consideration the vast floods which swell the waters and waste the flanks of the Bornean rivers and mountains, it is not difficult to conceive the formation of a vast tract of land in a period of time computable by far smaller units than most usually enter into the calculations of geological chronology.

Proofs have been multiplied of what is done by such agency in other parts of the world and perhaps no where is it more active than here.

Such a vast river it is not improbable may have flowed from the high land of central Asia over the basin of the China Sea (and though the distance be startling, there are longer rivers now existing on the globe, even in these days of supposed weakened geological action), and in the course of ages may have deposited in its vast Delta the Bornean coal field, to be afterwards tilted into its present position by the eruption of the vast granitic mass of Kina Baloo with its " tributary peaks in vassal rank declining slow". There are some circumstances connected with the consideration of the mixture of organic remains contained in tropical alluvial deposits now in course of formation which I do not remember ever to have seen any allusion to. In our temperate climate there is usually a broad line between the plants of the land and freshwater and of the sea and that not merely in appearance; (though some few exceptions occur, such as in the genera Rappia and Lostera). I doubt if even the plants usually inhabiting salt marshes are to be found except where there is some slight, though perhaps very slight, mixture of fresh water, and most of them, all probably except the subaqueous species, can exist without salt water at all; they grow, moreover, only in quiet muddy places, and anything approaching to a heavy sea would be fatal to them in a single tide. Not so with the marine plants of the tropics; the common mangrove (Rhizophora) grows frequently, not indeed to its greatest size, but in perfect health and vigour, with the waves breaking upon its arched roots, its singular seeds drop into the water and frequently float for. weeks before finding a nidus; so also do those of the nipa palm, which though never large in such situations, I have frequently seen growing in pure salt water, indeed when dislodged by floods its huge tufts often float about, living and growing, hundreds of miles from land, until they are loaded with barnacles, and the seeds float about germinating all over the China sea. Both these species of seeds must be daily deposited in millions in the modern strata of the Archipelago.

The Avicennia is still more marine in its habits, generally attaining its greatest size, which is considerable, when quite clear of the shore, and only apparently dry for an hour or two at low tide. I have often seen it on a reef, a mile or more from land, its asparagus like suckers covered with oysters, as are also in general the roots of the mangrove. Now, though the seeds of all these and many other plants loving the like situations, are protected by beautiful and obvious contrivances from being destroyed by the salt water whilst yet tender germs, as by corky or fibrous coverings, vast stores of albumen, or unusual development of either plumule or cotyledons in a sort of premature germination; what millions of them, and even of flowers and leaves in a high state of preservation, must yearly be deposited in what would appear to a temperate zone naturalist an unnatural juxtaposition with the exuviæ of the departed inhabitants of the deep. It must be borne in mind also that this marine flora is not small, either in size or number, many of the trees are large, heavy timber, and the number of species, not indeed all so hardy as the few described, are very great. An English geologist collecting shells and corals in the Suffolk crag would doubtless be surprised to find a leaf of fern in a high state of preservation, yet a large fern is here one of the commonest of these salt water plants, and hundreds of its fronds must be daily deposited among the testacea and Zoophytes of our Estuaries.

Another circumstance peculiar or nearly so to tropical climates, and which may very possibly be puzzling to the geologists of some future age, is the heterogeneous mixture of the testacea of the land with those of both fresh and salt water which is going on in many places, a confusion greatly increased by the ubiquitous habits of many tropical gasteropods. For example, among the genera usually considered as belonging to fresh water it is excessively difficult to say whether the genera Neritina and Navicella do or do not belong either to land or the sea. I have certainly found them on the open sea beach, as well as in places where no water could have reached them for months. A species of Truncatella, generally considered, as indeed it usually is, a land shell, I have seen below high water mark feeding on seaweed. Several species of Auricula classed as land shells, and by their affinities certainly correctly so, I have frequently found, evidently quite at ease, both in fresh and excessively brackish water. Many species of Cerithium appear quite indifferent whether they have salt or fresh water or none, and such genera as Leucostoma and Littorella, though certainly to be classed as sea shells, as surely often exist for days together without touching water at all, and live apparently quite at ease among such shells as Helix and Scarabœus. In estuary deposits, therefore, where not only this confusion of locality prevails among the living animals, but where also their remains are exposed to every chance of being deposited together in the ever accumulating salt and sand, the mixture of species must be very great.

I am acquainted with several places, for example the sandy shore of Victoria harbour at Labuan, where among the dead shells on the beach almost as many examples of land and fresh water species as of marine are to be found. It is true that the land testacea of the British islands are many of them to be found in greater abundance on the sandy plains near the sea than in any other situation, and that their exuviæ must be mixed in vast quantities with those of marine animals, but they are in size and number of species so inferior to the tropical forms, that the disproportion must at any time speak for itself, in applying these facts to the consideration of a science so necessarily generalizing as Geology.

A FEW REMARKS MADE DURING THE VOYAGE OF THE HIMMALEH IN 1837.[*]

By the late G. Tradescant Lay, Esq.

We left Singapore in the end of January of the present year, and returned to the same port soon after the middle of June. In this trip we visited Macassar, Bonthain, Ternate, Zamboangan and Borneo Proper. At sea our adventures were neither numerous nor interesting, but to stem opposing currents, and to deal with contrary winds, calms and sultry heats, taxed our patience not a little, and yet, in the end, when we reflect upon the nature of chances, we find less cause to complain than we do to be thankful to Providence for its manifold interpositions in our favour. At Macassar every thing is flat and dull, there is no motive for industry, no stimulus to enterprise. The spirit of monopoly on the part of the Dutch, and the insecurity of property, from the grasping and unchecked avarice of the native Rajahs, take from the subject every inducement he might feel to be useful either to himself or to others. The idleness and nonchalance that we see under every aspect and modification should excite our compassion, but never provoke our resentment, for it would be marvellous indeed if we discovered any thing beyond a regard for present ease and present gratification. Nor are there any extraneous circumstances that can awaken curiosity in a native, or stir up his energies: no well furnished stores to win his attention and make him desire better clothing, or any of the more showy implements of luxury. There is a long street within the walls of Macassar that runs parallel to the beach, and is called the Bazar, and I many times walked from one end to the other with a determination to buy something as a memorial of Macassar, but not a single article that was either pretty or ingenious could be found. A few common edibles, a small assortment of dyeing stuffs, a remnant or two of Chinese crockery, with a looking-glass and an ugly comb made up the average inventory of all their merchandize.[†]

The Macassar differs from the Bugis in having larger and more open features, as well as in the peculiar ruddiness that is mixed with the brown tincture of his skin. The hair is suffered to fall down and float loosely upon the shoulders, and has a red tinge oftentimes, by way of correspondence with the rest of the person. I have seen the truth of this circumstance questioned, because red hair and a dark complexion were thought incompatible with each other—an opinion that is not affected by this instance, for here the hair is not yellow nor orange, but its ends have a deep red hue, while the rest is black. The little boys and girls that you see running about in troops are often very handsome, while the lineaments of the latter are sometimes not only faultless in design, but they have withal a shade of thoughtfulness and melancholy, which is rightly esteemed to be the last touch and finishing stroke of personal beauty. These promises of future loveliness vanish before maturity, for the want, I suppose, of education, which, while it bestows unfading charms upon the mind, tends to model and perpetuate all the perfections of the body. I do not pretend to have a profound acquaintance with those branches of knowledge, that teach us to judge of the jewel by the shape of the casket; yet I cannot help thinking that the indications which I read upon the head and countenance of a Macassar, so often at variance with his present condition in the scale of morals and intellect, will hereafter unfold and explain themselves in a very delightful manner, when liberty and religion shall have cast their smiles upon him. That he is not deficient in head-piece is evinced by some productions of skill in the manufacture of gloves and baskets, where the workmanship for delicacy and fineness cannot be surpassed. We found them much in love with their own written character, which is the same as the Bugis, if we except the small deficiency of 3 or 4 letters. Many can read, and all would learn, if they had books to afford them the means of doing it. We observed, though many seemed to value themselves as being of a more ancient and noble stock than the Bugis, they esteem it creditable to understand that language, so that a translation of the Scriptures in this admired and far-famed dialect would serve for almost the whole of the humanised portion of Celebes. It is said that Dr Leyden translated a Gospel into the Bugis; if the manuscript could be obtained, an edition would be acceptable to many in that beautiful but neglected island.

---

[*] From the "Singapore Free Press" 1837.

[†] Macassar was declared a Free Port by the Dutch Government in 1847, and a considerable trade having sprung up in consequence, the aspect of affairs must be considerably altered for the better since Mr Lay's visit—Ed. J. I. A.

Their persons are exempt from those unsightly scabs and blemishes that we see in many other places, and this I impute to their cleanly habits. Wells are plentiful, scarcely a yard without one: hither males and females come to wash their clothes and bathe their skin, pouring many a bucket full upon their heads. It forms a part of the daily duty and amusement of old and young, and seems to be one of the principal cares of a mother. The person of a Chinaman at Macassar is exactly the reverse; it is every way unwholesome, for instead of an anxious rubbing and a copious effusion, the application of a filthy dishclout drawn over the neck and face once or twice completes the whole business of washing. The Chinese at the places visited by us were generally poor and often despised, since a native junk seldom or never comes to replenish their stores, to render them respectable or to find them employment.

Our stay at Macassar was during the wet season, when from the abundance of water and the lowness of the land that lay betwixt us and the mountains, it was not easy to travel even a short distance. The wind is westerly or north-westerly, so that the stores of rainy deposition fall upon the hither side of the hills. The atmospheric currents are cooled by their appulse upon the mountains; heat, the spring that keeps aloft the unseen vapour, is drawn off by the inferior temperature of the soil, and the vapour consequently descends in mists and showers. Mountains are one of the great causes of the atmospheric phenomena. If we could imagine a range of mountains to be upheaved on a sudden in the midst of the driest desert, a revolution in the character of the climate would immediately ensue, colds as well as heats would supervene, and rain and fair weather would succeed according as the wind blew towards or from the newly formed range—on the windward side wet and lowering, on the leeward side fine, with signs of rain and thunder, seen and heard only at a distance. In the Celebes, where, if we judge rightly, the mountains stretch from north to south, the season on either side is the inverse of that on the opposite, in reference to cold and heat, wet and dry. The Barometric column continued to perform its semi-diurnal ascent and descent, seldom more and very rarely less than one-tenth, being at its maximum about four hours after sunrise, and at its lowest depression about two hours before sunset. I think there is a correspondence between the elasticity of the air thus ascertained and the degree marked by the thermometer, for this instrument, if fairly placed so as not to be affected by heated currents, does not rise after ten in the morning and first begins to descend about four in the afternoon. This remark may look perhaps more like a hasty guess, than a fair induction; but I mention it here that others, who have opportunity, may look into the matter, and satisfy themselves as to the correctness of my views. Why the Barometric column should ascend and descend in the same way during the night will have to be explained by the aid of some other principle, hitherto undiscovered, but we should not despair, for every step in our investigations may be an approximation to, though by no means an arrival at the truth. I have imagined that I could discover traces of a diurnal movement in elongation, inclusive of the semi-diurnal, which if satisfactorily made out to exist with some degree of uniformity may be one means to lead us to a right conclusion. The first ascent of the Barometer and the first descent of the Thermometer in the afternoon is connected with a curious little fact in botany, the expansion of the flowers of the *Mirabilis Jalapa*, which is for that reason called the *Bunga Pukul Ampat* or four o'clock plant. At 4 the Barometer begins to rise, the Thermometer to fall, the *Mirabilis* to open, as if by mutual understanding.

One of the prettiest plants I saw at Macassar was the *Damasonium Indicum* or tilepo; the petals are of delicate white, and the long calyx has it corners ornamented with a fringe gathered into a kind of flounce or furbelow. It is common in some of the floods and pools, and arrests the attention no less by the beauty of its figure than by the singularity of the leaves, which bear some distant resemblance to the way-side Plantain of Great Britain. In the same waters we find a species of Mimosa, with large yellow flowers and very long floating stem, covered between the joints with a spongy substance. But notwithstanding the large supply of moisture that is laid up in the spongy receptacles just mentioned, existence out of the water is not to be tolerated for a moment, for as soon as you attempt to lift up one end of the stem the leaves begin to fold, the nearest first and then the more distant in succession. When the plant is restored to its native element, the leaves once folded from such an injury never revive and expand, teaching us that this sensibility is something beyond the ordinary range of mechanical causes. A French experimentalist found some nervous matter in the sensitive Mimosa; I think this would have yielded a copious supply for examination. I have magnifiers fitted for every purpose, but there are so many objects demanding attention, that I should not be able to manage so delicate a business with much likelihood of success.

At Bonthain we stayed only two days, and as it rained during one of them we had but little time for research. The town is seated near the nook of a farwithdrawn indentation in the coast, where the land from each point climbs by an easy but varied ascent into a magnificent amphitheatre of mountains. The cascade a few miles from the Residency is an object of much curiosity, a stream of water about three fathoms in breadth falls over an escarpment, which we guessed to be about 150 feet in height. To the eye it seems perpendicular and the vertical plane is only interrupted here and there by a ledge that makes only a small divergence in certain points of the stream. The cold within reach of the spray was very great, but what the real depression of temperature was I cannot tell, as I was so unfortunate as to forget my thermometer. Water when in the state of moist or steam seems to have a great affinity for caloric, hence the reason why we feel a strong sensation of cold when a mass of cloudy vapour is moving towards us in the atmosphere.

The natives here are said to speak a language different from the Macassar, but I apprehend the dissimilarity is neither great nor radical. The only matter of interest among the natives is a market held at the head of the bay every fifth day. Towards this point all are seen hastening soon after day-break with their various items of merchandize. Rice and the Siri with accompaniments, a few sorts of bark for dyeing, some India goods and Javanese copperwares are brought for sale. I supposed at first that the productions on one side of the harbour were different from those on the other, but I was mistaken, for I saw large pink-colored bambu-shoots and other vegetables returning by the same way they had come. So, for any thing I know to the contrary, a man might carry a bundle of such things three or four miles merely to sell them to his next neighbour. But there is nothing laughable in this, for nature has implanted in us a fondness for *cœtus et celebrationes,* as Tully remarks in his Offices, so that a man does not scruple to trudge a few weary miles that he may behold and converse with a company of his fellow-creatures, and in such a celebratio or assembly sell his goods to the highest bidder, though he might have disposed of them at as high a price by walking only a few yards from his own door. In speaking of vegetables, I might just mention, that the potatoes, *solanum tuberosum,* not the *convolvulus batatas,* or sweet potato, cultivated at Bonthain may be compared to any in the world for their excellence. A loose pulverulent soil, such as Trappean rocks generally afford, and a sunny exposure on the side of a mountain, are circumstances highly favourable to the growth of this useful article of diet.

The Tamarind tree, which is scarcely to be found at Macassar is very common at Bonthain, and attains to a very large size. In the former the Mango makes the greatest figure and in fact composes the major part of every grove and copse, in the latter its place is taken by the tamarind. The size of the tamarind tree is finely contrasted with the delicacy of its leaves and the minute workmanship of the blossoms. It belongs to the Leguminous family, in which according to analogy we generally find ten stamens, either standing apart or collected together into one or two bundles. But in this we find 3 perfect, 4 imperfect and 3 transformed into leaves, called nectaries by Linnæus. These nectaries have a yellow ground with a most beautiful veining of red, so well filled, that it is difficult to say which of the twain is the predominant colour. It would not perhaps be safe to guess why the mango prefers Macassar, and the tamarind chuses Bonthain, but we know that in one case the soil is alluvial, in the other it is not, one side is sheltered from westerly winds, while the other is exposed to all their influences. Macassar is notorious for its rain, while Bonthain is in much repute for fine weather.

At Macassar the *Indro* or Gomuto palm is very common; at Bonthain it is replaced by the Lontar palm, which often presents itself as you ascend the hills in large clumps. It is known here by the Hindu name of *Tala,* and yields a juice that is very refreshing when obtained in a pure vessel. But it is customary to catch it in an old bambu tube, which sets the process of fermentation at work, so that it is seldom free from an acid, and to one not used to it, a very disagreeable taste. In this state it is much relished by the natives, who pass the tampurong or shell to each other as if they drank more to please their palate than to allay their thirst. The stem is remarkable for its straightness, bare in the upper parts, but often covered with a loose texture of sheathing below, which is characteristic of the tree. The leaves spread themselves out in large fans, and the fruit, about the bigness of a small cocoanut, grows in clusters and has a yellow and brown so intermixed as to exhibit a very pleasing object on the top of the tree.

The Moluccas exhibit a very singular feature in the exact conical form, with which most of them rise above the horizon to meet the navigator at the distance of 80 or 90 miles. In other cases he is glad to have the flying contour of a landscape to guide him in the recognition of the coast and headlands, but there is something so peculiar in the aspect of these islands, that he feels confident he never can mistake them. We have for many years been accustomed to view this conical shape as intimately connected with volcanic action, nor do we find any reason here to throw aside the old theory and adopt a new one—for the top of Ternate has been ejected, and a vast yawning crater left behind, so that we have two peaks, one on each side. The one, therefore, which seemed so perfect at a distance,, is found to have a notch instead of an apex at the top, with an additional ridge compounded of two others just below. In the instance before us we find no traces of a fluid or stream of melted matter that flowed out during the eruption, which we are apt to think of whenever we speak of a volcano. An immense quantity of rock in fragments of various sizes has been thrown out, which bear marks of having been subjected to the action of fire. Some have been reduced to cinders, some vitrified, while others have felt just enough of the fire to split them into huge blocks. If pieces of stone were laid up in piles in a furnace, we coulld easily conceive that this is just what would happen, those that were immediately submitted to the action of the fire, would be either vitrified or converted into a slag according to the length of time and the intensity of the flame, while those near the centre of the pile would only be partially vitrified or merely fractured by the heat. The belly of this mountain, which is between 5 and 6 thousand feet in height, might have been regarded as one enormous furnace, which continued to burn in secret till the explosion of some gaseous matter projected the "fuelled entrails" to an amazing distance. On the north-eastern side immense piles of rocky fragments in the state just described are found, in every way corresponding to those that lie about the edge of the water. The reader should however be informed that these piles have their longer sides at right angles to the line in which they were projected. This circumstance has so much puzzled some very good judges, that they were driven to suppose, that the lines were proraised by the bubbling up of the rock from underneath. But there is no rent or chasm, nor the least trace of any rupture near them to countenance that opinion. We are therefore obliged to assume, that they came from the top of the mountain by a road that is paved with fragments, and which by reaching down to them, seems to lead the eye to the spot from whence they were derived. The mode of arrangement is perhaps not altogether inexplicable, when we reflect on the way in which motion is communicated in solid bodies, that is by the alternate upheaving and dipping of the surface in a series of undulations. This may be exemplied by spreading dust upon a board, and then shaking it gently for a few seconds, when the former will be collected into wavy lines running nearly parallel to each other. It is conceivable that during the eruption, the earth "wrought" with an undulatory motion to such a degree, that the stones were packed up in line as they fled from the crater. But how tremendous must have been the struggle of nature, when masses of rocks weighing several hundred tons danced upon the surface of the earth like grains of sand upon a writing tablet!

Four of us started to mount the steep acclivity of Ternate, but two of the company soon gave up, which left Mr Dickenson and myself at leisure to pursue our inquiries and rejoice amidst the wonders of nature untroubled by the splenetic remarks of any heart-sick companions. The soil of Ternate is perhaps in all respects the best that can be found in any part of the world, and there is something in its dark crumbling texture that impresses the mind with the highest ideas of its fertility, while the vegetable creation around you bespeaks in the strongest and most lovely terms the extreme happiness of all its members. The sultry parts of the day are often fanned by a breeze, and the nights are very cool, the thermometer having been known to descend as low as 56. Though this may be rare, yet the sheet or coverlet are seldom unwelcome. All stress is therefore taken off the system during the night, and nature so far recruits her powers and repairs the wastes of the day, that in point of salubrity there seems to be no place like Ternate within the tropics. This assertion is not intended to be made absolutely or as if there were no exception in favour of any other region; for though I have travelled much, I have not examined the meteoric phenomena of every quarter within the tropics. But still the hand of God seems to have poured out blessings upon the Moluccas in a stream of overflowing plenteousness; from "the beginning to the end of the year" health, beauty, and softness move in one unbroken circle. If the beneficence of the Deity puts on an air of peculiar loveliness in these places, the malice of man has been no less conspicuous in thrusting forth itself in all its hateful deformity, as if it had been the proper business and function of a human creature to be the very inverse of his Maker, and to resemble as much as possible the evil one, who is emphatically styled in Scripture, both in Greek and Hebrew, the Destroyer. The Dutch not content with the devastations they could make by themselves, among the spice trees, at last resolved to hire the native Rajahs to assist them in the execution of their diabolical purposes. The trees have in consequence of this proceeding been nearly extirpated; the few that remain probably escaped the notice of the destroyers, while the natives robbed of what was their glory have lost all feelings of independence and personal right, live and look like the sons and daughters of oppression. Their subsistence is derived from the tillage of the soil, or the tendance of durian, mangosteen and other fruit trees. And I dare say that those philanthropists who think it is enough for a poor man, that he feeds and sleeps with as little intellectual disturbance as possible, would find much to admire in the condition of the people. The gentleman mentioned above and myself took our seat in the carriage of the Resident and were received by the Sultan with much ceremony and military display. Malay forms of etiquette and a field officer's uniform are not altogether at variance with each other, while the address and venerable appearance of the individual must have inspired sentiments of respect could one forget that he received a pension to act the foe instead of being the friend and patron of his subjects. When I speak of the Dutch I mean the Dutch government, without reference to individuals, for it is only the part of common courtesy to acknowledge that the Governor of Macassar shewed me every mark of respect and attention and the farewell of the Resident of Ternate was accompanied by a charge to return as soon as possible, and with him explore all the beauties of the Moluccas.*

Zamboanga has a neat appearance when viewed from the Straits of Basilan, but possesses no buildings of any beauty or magnificence. A church is in process of being erected, which will have a very good effect from the sea. The inhabitants wear a very pleasing aspect, the intermixture of Spanish blood having contributed to beautify and polish their features. The Spanish language is uniformly spoken, and very few know much about the mother-tongue of their fore-fathers. Many are taught to read and write with some of the more familiar rudiments of the Catholic region, but the characteristic of this people is a happy exemption from care, disease and labour, since all the necessaries of life may be obtained by the smallest exertions of industry. When we entered their dwellings they talked to us with the most perfect good nature, and seemed in no way restrained by our presence. When wet, hungry and tired in travel they gave us a share of the best hospitality their houses could afford, and out of compliment to their guest descanted upon the happiness and prosperity that would arise to the settlement, had they but English instead of Spanish masters. A few miles walk from the town brings you to a country delightfully varied with the interchange of mountain and plain. These plains are smooth with only here and there a shrub or a little copse perhaps. I confess there is something in a wide campaign that is inexpressibly engaging especially when we meet with it amidst a range of hills, where the eye after expatiating a while in the liberty of the expanse before it, can rest by turns upon the green pinnacles, that shifting behind each other in perpetual succession, sweep around the spectator, and form an amphitheatre of elevation.

---

* The extirpation of the spice trees is now now longer prosecuted, although its effects are of course still felt. The monopoly of the spices is continued, but the system now pursued is not so oppressive to the natives—ED. J. I. A.

The mountains in this country are in a high state of degradation, in the language of geologists; that is, the rock has, from the action of the atmosphere and other causes, lost its continuity and crumbles into powder with the remains of vegetable matter. It was only here and there that a lump which had not suffered from disintegration could be found. The best specimens were taken from a boulder of trap studded with iron pyrites. This part of the island seems therefore to belong to the trappean series, but as I could not attain any sections from a rupture of the strata, I make this remark with some degree of hesitation.

In Borneo Proper we ascend two or three steps higher in the series of rocks, and find ourselves amidst nothing but sandstone in a high state of disintegration. It was only on one occasion that I was able to find a piece of stone, that could not be broken by merely compressing it in the hand. And this was from a solitary piece that jutted out from the ridge of hills that runs a long distance towards the N. W. Betwixt the layers of disintegrated sandstone we often found layers of clay, and the water that was filtered through the former ran upon the bed till it burst forth in a clear crystal spring. The alternate stratification of clay and sand must have taken place anterior to the lifting up of the crust. They are elevated in all cases at an angle of at least 45 degrees, so that the ridges of the hills are remarkable for their sharpness. We might in reference to the geological state of Borneo say in the language well understood in many parts of England, that we are among the "coal measures;" since seams of that mineral are found in several places. One of them I accidentally struck my hammer upon as it crossed a stream of water. Being covered with sand its nature did not appear till after this trial, when I discovered a bituminous coal of great lustre. Pulo Cheremin, an island near the mouth of the river, receives its name, looking-glass or mirror, as I suppose from the brightness of the coal found upon it. I visited this island only in the night, and though I picked up a piece of coal by the sense of touch, I know nothing of its geognostic characters. Many interesting researches might have been made, but boats and men could be had for neither love nor money. The few opportunities that we obtained were spoiled by our guides, who never ceased to urge our return from the moment of our landing till our return to the edge of the river, labouring all the while to inspire us with the same cowardly fears that they felt themselves and pourtraying nothing to our imaginations, but the terrors of the sumpitan of redoubted memory. It was not difficult to esteem these terrible things as existing chiefly in the fearful soul of the narrator, but it was by no means easy to examine anything with care among a swarm of such plaguy rogues.

The city of Bruni consists of two ranges of houses standing upon the water at the bend of the river, and contains about 25 thousands of inhabitants. The straight stem of the Nibong serves for piers, the walls are formed of bambu, and the roof is covered with the Nipa, the most elegant of the palmy group. The feudal system prevails here in all its integrity; the whole population is divided into the *hawan* or vassals of each respective *Pangeran* or chieftain. Their duty is to attend upon their lord when called for, and to provide all the substantial things of life for his enjoyment. All work and no pay is the character of their servitude, but acts of cruelty are not common, indeed a man cannot be punished for any capital offence without a trial and a hearing before the principal chieftains. The Sultan is elective though the limit of choice does not extend beyond the royal family. All the affairs of state are administered by the Pamangku or Mangkubumi, or Prime Minister. The respective share, that each one of these personages takes in the affairs of Government, was briefly summed up in four words by a brother of the Sultan: "Sultan bilang, Hassim kirja;" the Sultan speaks, Hassim acts. Hassim is a man of great mental endowments, and therefore not only manages the executive department with talent and resolution, but exerts such a check upon the Sultan that his antics and baby pranks are mostly confined within the limits of the Astana. Selfishness, pride and cowardice, which are apt to mix themselves with everything that is human, stand forth in the highest relief in the whole compositton of their character. In all the details of daily intercourse these qualities meet you at every turn, and seems to pervade every action and every thought.

In the South Seas I saw many specimens of religious hypocrisy in persons whose temper and conduct, I then thought, could not be surpassed for odiousness; but I protest, that I have greatly altered my opinion during the present expedition, and have arrived at the conclusion, that Christianity in its most depraved form, or if you please, the very refuge and sweepings of it, are better than the best of heathenism. It should not be concealed that in many instances they manifest the strongest desire to adopt the dress, the manners and the sentiments of Europeans. They display much sagacity and taste in selecting points of imitation, and would, I doubt not, be very successful in their attempts this way, but it seems that they do not mean to throw aside their ancient customs, but merely engraft such as they like among foreigners upon them. They do not seem to feel that there is any discrepancy between dress that is native and half foreign, and I must do them the justice to say, that they compound matters with much skill and adroitness. In the same way many seemed by no means unwilling to treat Christianity as a supplement to Islamism. Sometimes when a Pangeran could not obtain an article of dress that he begged, he would say: Give me a book. It contains the Agama Isa, was the reply; to which he would rejoin, *Saya mau mengagi,* I desire to learn it. Some had copies of the Bible and Testament which they obtained from Singapore. One brought the quarto of the Calcutta Bible Society, which he said he very often read, and we may believe him, for he read that unsightly type with great ease, which for one used only to the written character requires a good deal of practice. "Tuan perchaya?"—"bagimana tiadah perchaya, batul batul." Do you believe it—how should I not believe it, it is all very true. Some who often requested to have a book were disappointed in the end, for when the Minister came on board, and in fact, while he sat in my cabin looking over my philosophical and surgical instruments, the books were given away to his brothers and other Pangerans. Some carried away their gift or gave it to their attendants, but the rest pur theirs into a box in which three or four had been laid for the Sultan and his brothers, who had reminded me of my promise a dozen times. This box the master of the vessel though fit to intercept, and thus as far as he was able give the natives to understand that they were dangerous things.

Wherever we went, Singapore was spoken of as a place of the greatest importance among the natives, who had sense to see that there is something great and noble in the very name and idea of freedom, and no reason can be given why they should not in time begin to pay an outward deference at least to that religion which has insured that freedom to us. The vilest men in the qualities of the heart and understanding will have it in their power to frustrate the best intentions, it being so much more easy to do harm than it is to do good. Knowledge and religion however have begun to shine upon the world, the devil and his emissaries will do their best in vindicating the cause of obscurity, for they are industrious folks; but should this sun of illumination endure now and then a partial eclipse, it will only be that it may shine the brighter for it afterwards.

CONCERNING COLONEL FARQUHAR'S GOING TO LOOK FOR A PLACE TO ESTABLISH A SETTLEMENT.*

ONE day news arrived in Malacca that an English ketch was captured by pirates between Pinang and Malacca, that an English lady passenger had been taken by the pirates to the Eastward, and that the ketch had last sailed from Pinang. A few days after this news became known in Malacca, it was reported that Colonel Farquhar was about to go out with an English ship to search for the lady above alluded to. Mr Farquhar took 4 or 5 Malacca Malays, among whom was Inche Yahyah bin Abdul Wahid, called Inche Siang, and with them set sail. The secret of Mr Farquhar's expedition was not known to a single person in Malacca, further than the common report that he was gone to search for the lost lady, so that I cannot here give a full account of the affair, but after the return of the vessel to Malacca I made secret enquiries of those who had sailed, and after some time found that they had not been employed in searching for the lady, that such a report was given out merely to withdraw curiosity, as the English did not wish then that their intention to found a new settlement should be known. First Mr Farquhar went to Siak to negociate with the Rajah about the possession of ground to form a settlement at Tanjong Jatti, but it was found that in the north monsoon the sea at that place was so heavy that ships could not anchor there, on this account the project was stopped. They then went to Dai (Linga) and what took place in the meeting with the Prince of Dai I don't know, but they left that place and came to the Carimons. They went on shore there and examined the place thoroughly, hills and vales, and the Rajah was greatly pleased. They went to search for a suitable anchorage ground, but the place was so filled with coral reefs and rocks, that no harbour for shipping could be found. They sounded all round the island and found the depth of water to be very great, there was no place where vessels could run for shelter in a gale, and if a slight mistake were made in piloting, a boat even would run on the coral reefs. For these reasons the decision was against the Carimons. They then sailed for Johore and having arrived there landed, but from what reason I don't know, they soon came down to the sea and re-embarking returned to Malacca.

The same day Mr Farquhar returned to Malacca, he appointed Captain David (Davis) to act for him, and again set out to search for a place to form a settlement. Two days after Mr Farquhar had sailed, 2 large ships and a ketch under Dutch colours arrived, bringing with them the Dutch Governor and

---

* Translated from the "Hikayat Abdullah bin Abdul Kadir Moonshee," by T. Braddell, Esq.

Secretary and officials with Dutch and Javanese troops, &c. complete, in order to receive over possession of Malacca from the English. At that time many people of different races were pleased at the Dutch returning to occupy Malacca, as they thought they would be less oppressed under the Dutch than under the English. They little thought that those who were coming were like leeches to suck the blood from their bodies. I was very heavy hearted, because I thought that all my trouble, pains and diligence in learning the English language would be lost, as, unless the English remained in the country, to whom could I sell my commodity; and moreover I could not speak one word of Dutch. My face became pale to see the joy of all the Dutch people, who now taunted me about my learning English, and my liking for English people. They were rejoiced now because their countrymen, whose language they spoke, had come. Many of them said to me—what is now the use of the English which you have learned, if you had learned Dutch it would have been of service to you, many Dutch people now will be anxious to learn Malay, as this country will be kept altogether by the Dutch. When I heard these speeches I thought seriously over my affairs and sometimes repented of having learned English. But my confidence in the goodness of God was great, and I felt that he would provide for me.

On the arrival of the Dutch ships the people landed at Banda Hilir, for, on account of Mr Farquhar's absence, they could not yet get possession of the place. In five days Mr Farquhar arrived, he gave a power to Captain Davis, ordering him to make over the settlement to the Dutch, and on the same night he (Mr Farquhar) sailed again.

On the next morning at 7 o'clock the Dutch troops marched into the fort, headed by their officers, with band and drums and pipes playing, and with the Governor and Secretary with the Dutch flag. They all had their drawn swords in their hands and when they marched up to the flag-staff, the English garrison was drawn up, officers with drawn swords, and band playing. When all was ready the English flag was first hoisted, the English drums and pipes playing in a way to thrill the heart. They all appeared to be in grief, their faces were downcast and sorrowful, they looked like dying people. After flying for about 10 minutes the English flag was lowered. The two parties English and Dutch were drawn up, meeting at the flag-staff, and there was also a great crowd of people about looking at the "tamasha," and there were people ready to read the proclamation in the four languages. After this the Dutch flag was hoisted with music playing as before, when after flying about 10 minutes it was lowered, and to see the conduct of the two sides when the flag was being lowered, one would think they were going to kill each other, they were so angry that the colour of their faces was changed to red, they looked like tigers about to spring on their prey, with their arms all ready drawn for use. After that both flags were hoisted together, and after flying together a short time, they were both lowered, and raised again three times, till the English flag was finally lowered by degrees. Many of the English had tears in their eyes. Their drums and pipes played slowly, like the voice of a man wailing, and the crisis of their grief arrived when the flag touched the ground. At this time the proclamation was read in different languages. It ran thus:—"Know ye all manner of people in this country, that this proclamation is read and explained in order to give notice, that the "King of England has made a treaty of peace through his great "men and ministers, by which the settlement of Malacca is made "over by His Most Gracious Majesty the King of England to "His Most Gracious Majesty the King of Holland." After this proclamation was read all the English retired, and the Dutch troops proceeded to relieve the several guards hitherto supplied by the English. The name of the new Governor was Timmerman Thyssen and the Secretary Baumhaur (Baumhouse) and the commander of the troops Maijoor (a Veronese). On the same day the Governor removed into the house of the English Governor, and the Secretary occupied a house in the fort on the sea side. The houses of both were guarded by armed and belted peons, who came with them from Java and Madura.

Concerning Singapore.

I now return to the relation of the adventures of Colonel Farquhar in his cruise in a ship. He directed the vessel to be steered to the Straits of Singapore, as he was an old friend of Tuanku Long, son of Sultan Mahomed, and had known him during his residence at Malacca. I have heard it stated that he had given the Tuanku large sums of money in consideration of receiving the island of Singapore in exchange. He now wished to go to Rhio to conclude the arrangement, before returning to Malacca, to make over that settlement to the Dutch. All the agreements and correspondence relative to this transaction were sent to Mr Raffles, who was at that time at Pinang, and who laid the whole affair before the Bengal government. In reply the Bengal government wrote to say, that if they wished to establish a settlement at Singapore the Company would not prevent them, but that, beyond the personal expences of themselves, that is Mr Raffles and Colonel Farquhar, they would not sanction any expenditure of public money. However, if the settlement was formed now they would take into consideration the question of expence hereafter. Mr Raffles assured government that he would consult with Colonel Farquhar, and that they would certainly succeed in forming a Settlement at Singapore. Mr Raffles on this came to Malacca, and, after arranging with Colonel Farquhar, sent him on to Singapore to conduct matters, in the best way he could, till he was himself enabled to go down, as at that time he was ordered by the Governor-General to proceed to Acheen, to settle some internal differences between Acheen, Pedir and Semami, which threatened a civil war concerning the succession to the throne, and in consequence of which they had requested the mediation of the Governor-General. When Colonel Farquhar arrived at Singapore he landed in one of the ship's boats, with the Malacca men whom he had with him, and walked to the plain, at the place where the present Court-house stands. This plain was at that time covered with kurumunting and sikadudu bushes. On the banks of the river were four or five small huts, with six of seven cocoanut trees planted round them, and there was also an artap house, a little larger, in which the Tumonggong resided. After making these observations, Colonel Farquhar proceeded to walk round the plain, when some Orang Laut who met him ran to inform the Tumonggong of his arrival. The Tumonggong shortly made his appearance, with some of his armed followers. Mr Farquhar sought the shade of a tree, on account of the great heat of the sun, and he there received the Tumonggong with politeness, shaking hands with him. The Tumonggong invited him to enter his house, and when they got there, Mr Farquhar informed him of the reason of his coming, and related the whole business from its commencement, how that Mr Raffles had written to him from Bencoolen, desiring him to look out for a place to make a settlement, as Malacca was to be restored to the Dutch, that if they could succeed in establishing themselves at this place (Singapore), it would be a great benefit to the Malays, as all the European traders will come here to trade with them. And a great many more sweet and pleasant words were used to soften the heart of the Tumonggong; indeed sugar candy was put into his mouth by Mr Farquhar (figuratively). The Tumonggong answered: "I am come here from Rhio, to live quietly; you " know, Sir, the ways of Malay princes, how each one endea- " vours to aggrandize himself, and on that account I have thrown " myself on this small island on the ocean, and I am also the " lawful owner of this island, as, by the Malay customs, the " Tumonggong has command of all the islands in the kingdom, " but our rightful prince is dead, that is Sultan Mahomed. He " left two sons, by different mothers, one named Abdulrahman, " and the other Houssain called Tuanku Long. Now after the " death of Sultan Mahomed, great differences existed among " the nobles of the Dai country of Rhio and Pahang, as to " which of these princes should be installed as king, for they " are both sons of the late king. Tuanku Putri, widow of the " late king, was in favour of Tuanku Long, and some of the nobles " were in favour of Tuanku Abdulrahman. In this state of

" affairs Tuanku Abdulrahman went to Tringanu, and Tuanku " Long remained at Rhio. This is the real state of the affairs, " and all the Regalia were given over to the keeping of Tuanku " Putri, the last king's widow." When Mr Farquhar heard this relation he smiled, and said that Mr Raffles was acquainted with the history of the affair, and then, to change the conversation, asked, "what is the name of this hill near us.' The Tumonggong answered, "it is called Bukit Lardugan (the forbidden hill) from the times of old." Colonel Farquhar enquired, why it had been so named, the Tumonggong answered, "it is related in history, " in the time of the ancient kings, that their palace was built on " that hill, and in consequence people were forbidden to go up " the hill, without being sent for, or without having the permission " of the king. On this account it was called the forbidden hill. " There is also behind the hill a stream of water, called the forbidden stream, as it was the place when the ladies of the palace " bathed, and in consequence no one was permitted to go near it." After this Mr Farquhar said, "I have come here, Tuanku, after " having consulted with Mr Raffles, and also with the consent " and approbation of Tuanku Long, son of Sultan Mahomed of " Rhio and Lingin, to receive over the island of Singapore for the " English company, in order to form a settlement here, that the " names of the old kings may be restored to fame, and to shew " forth the friendship and affection of Tuanku Long and yourself " to the English Company. Under these circumstances, pending " the arrival of Mr Raffles, we can ourselves arrange on fair compensation to Tuanku Long and yourself, in order that we may " make an agreement between the English company on the one side, " and Tuanku Long and yourself on the other. You can now " consider what terms you would propose as fair between us." When the Tumonggong heard this speech of Colonel Farquhar, he hesitated, and after a short silence said, "Sir, I am under the orders of Tuanku Long, and if this affair meets with his approval, I also will consent." Mr Farquhar answered, "well, if you think Tuanku " Long will consent, let us make a written agreement. To this the Tumonggong replied. " What is the use of my signature, is my " word not sufficient?" Mr Farquhar answered, "it is a " custom with us Europeans to make an agreement on paper, " so that we cannot afterwards draw back from our promises." Mr Farquhar then desired Inche Siang to make out a paper to suit the ideas of the Tumonggong and in a few moments a paper was drawn up, according to the terms of Mr Farquhar's conversation, as follows:—" This document certifies the wish of the " Tumonggong to be an ally of the English Company, and truly it " is his desire (if the consent of Tuanku Long is obtained) to make " over Singapore Island to the English Company, that is to Mr " Raffles and to Mr Farquhar, in order that they may there form " a settlement," after being read over the Tumonggong signed the paper and Mr Farquhar then took his hand, and cordially shaking it, said "from this day, Tuanku, you and I shall be friends for ever." After this Mr Farquhar said "Tuanku I wish to land my tents, where shall I set them up." The Tumonggong replied "wherever you please." Mr Farquhar said, "I think this plain will be the best place" and in a short time the ship's boats brought some of the people with the tents. A portion of the people were set to clear the brushwood, and the rest to set up the tents. In about a couple of hours the tents were erected, and Mr Farquhar ordered the people to dig a well, under a kalat tree, and the water from this well was used by them all. There were 30 Malacca men with them at that time, and they relieved each other in keeping watch round the tents during that night. Next morning a post about 6 fathoms in length was erected, on which the English flag was exhibited, this was at the edge of the river. At that time provisions were not to be obtained at Singapore. Mr Farquhar gave his people 20 dollars to go and buy some, they went and searched in vain, none could be obtained, so that they were obliged to be provided from the ships. There was money to buy, but there were no supplies to exchange for it, the inhabitants of the two or three huts near the Tumonggong's house subsisted on fish, sago, and delicate shoots of some trees, with occasionally a little rice. At the other end of Campong Glam there were 2 or 3 huts inhabited by Orang Laut, of the Suku of Glam Toongal, who were engaged in making kajangs and mat sails, on this account the place retains the name of Campong Glam.

At that time no mortal dared to pass through the Straits of Singapore, jins and satans even were afraid, for that was the place the pirates made use of, to sleep at and to divide their booty, after a successful attack on any ship's boats or prahus. There also they put to death their captives, and themselves fought and killed each other in their quarrels on the division of the spoil.

Concerning these "Orang Laut," who live in prahus, they are like wild beasts; when they meet any one, if possible they paddle for the shore, but if they have not an opportunity of escaping in that way, they jump overboard and dive like fishes; perhaps for half an hour they remain under water, when they again appear, 100 or 200 fathoms off. Men and women and even children are alike in this respect. It is impossible to express their consternation when they see civilized men, their faces appear as if they had met a tiger. These people supplied the Tumonggong with fish. They were not acquainted with any other method of catching fish except by spearing. In this manner different kinds of fish were obtained, tingiri, and sometimes parang parang. At that time the fish at Singapore was tough and hard like a buffalo hide, as people were not accustomed to eat fish (to cook), and moreover the fish were very tame. At the beach people could catch large fish; and ramis (cockles) were plentiful, coming up themselves, so that in a short time one could collect gallons of them.

The Tumonggong ordered the Orang Laut to bring fish to sell to the new settlers, and certainly they came, but with fear and surprise at the extraordinary things they saw, particularly the tents and clothes worn by the people. They sold their fish, or exchanged them for small quantities of rice and tobacco. Mr Farquhar took care to encourage them by presents of rice, money and clothes, so that they soon became familiar; but some of those who had not such opportunities were oppressed with fear, to such an extent, that they became unwell, and one lad was drowned opposite Teluk Ayer. On meeting some prahus he was seized with fear and jumped overboard, when the tide running very strong he was overpowered and his body drifted out to sea.

Every morning Mr Farquhar was accustomed to walk about to examine the country, but it was covered with large jungle, except the centre of the plain, where there were only kurmunting and sikadudu bushes, with some kalat trees, and the sea beach was covered with ambong and malpari and bulangan trees, and branches of them were strewed about, and, on the other side of the river, nothing was seen but mangrove trees and jeruja with branches lying round. There was not a spot of good land, besides a piece 10 fathoms wide, the rest was a mud flat, except the hills. There was a large hill at the end of the mouth of the Singapore river.

At the mouth of the Singapore river there were many large rocks, and the passage among them is crooked like a snake wounded by beating. Among the stones there is one with a sharp point, like the projecting point of a sword fish. This rock is called by the Orang Laut "the sword fish's head rock," they believe that it is haunted, and at that place they are accustomed to make all their solemn agreements, as they hold it in reverence. They also pay great respect to the rock, decorating it with flags, saying, if they dont pay respect to it, it will destroy them in their incomings and outgoings, on which account they make daily offerings, which they place on the rock. All along the beach there were hundreds of human skulls, some of them old, some fresh, with the hair still remaining, some with the teeth still sharp, and some without teeth, in fine they were in various stages of decay. Mr Farquhar was informed of this, and he ordered them to be collected and thrown into the sea, they were all put in sacks and thrown in accordingly. The Orang Laut were asked whose skulls there were, they answered.—"These "are the heads of people who have been killed by the pirates. "Wherever those people attack prahus or ships, they come to "Singapore to divide the booty, here they quarrel and kill each "other in making the division of the spoil. Some of their prisoners they tie at the edge of the beach, and practise with their "weapons at them. Here also they fight cocks and gamble."

Mr Farquhar wished to ascend the hill, called by the Tumonggong the forbidden hill, but the Tumonggong's people said they were afraid to go, on account of the numerous spirits there, for every day sounds were heard on the hill, like the noise of many people, sometimes gongs were heard, sometimes people were heard shouting. On hearing this Mr Farquhar smiled and said "I wish to see those ghosts" he then desired his Malacca people to drag up a gun. Among them many were afraid, however they dissembled their fears, and drew up the gun, but not a single man of Singapore dared to go near the place. They who went were all Malacca men. At that time there was not much jungle on the hill nor indeed were there many large trees, but even with this the people were afraid, and it was only from fear of Mr Farquhar's ridicule that, whether they wished or not, they went with him. When they got to the top of the hill the gun was loaded and fired off 12 times by Mr Farquhar, who then ordered a post to be erected, on which the English flag was displayed, after that he ordered the hill to be cleared, and a road to be made from the top to the bottom. This was the manner in which Mr Farquhar acted, every day he was engaged in clearing jungle and making roads.

At that time there were no animals in the Island of Singapore, either wild or domesticated, except rats, which abounded in incredible numbers, all over the island, and were nearly the size of cats. They were so large that, in walking out at night, we were liable to fall if we tripped over them when lying coiled up. In my own house I kept a cat, and one night, about midnight, we heard a great noise, as if from the squalling of this cat. My companion (servant?) got up and lighted a dammar to see what the noise was about, he found the cat surrounded by 6 or 7 rats, who were biting it, some on the ears, some on the legs, some on the chops, so that the cat could not move, or do anything but mew. When the man saw this he called to me, I got up and went to see and 6 or 7 others also came to see, but even this collection of people did not make the rats leave the cat. When the cat saw us it increased its mewing as if it were asking our assistance. Some of the people took sticks and killed two of the rats, which were holding on by the cat's ears, and when the cat found itself free from them it violently attacked a rat which it killed, another was killed by the people and then the rest fled, leaving the cat's face covered with wounds and bloody.

In the same way all the houses were filled with rats till it was almost unbearable. It was the same in Mr Farquhar's tent. At last he gave orders that whoever killed a rat should receive one anna. When the people heard this proclaimed, they set about making different sorts of traps to catch the rats, some made use of of poison, and some of gutta tikus. I never, till then, saw rats caught with gum. Some were active in discovering the rat's nests, and some speared them. There were many different ways of killing them. Every morning the people collected at Mr Farquhar's residence, bringing the bodies of the rats, some with 50 or 60, and some with 6 or 7. At first they brought thousands of carcasses every morning, and Mr Farquhar paid them as agreed, but after 6 or 7 days he saw the numbers increasing, when he fixed a new price, 5 doits for each, and at this rate they brought them in thousands. A deep pit was dug in which they were buried. The rats became scarce, till they brought at last only 10 or 20 every day, when the rat disturbance and war ceased in Singapore.

A few days a ter great numbers of Alipans (centipedes) appeared, and people here and there were stung by them. In all the houses, if one sat down for a few minutes, 2 or 3 lipans fell down from the artap roof, and on getting up in the morning from our sleeping places we were certain to find 2 or 3 lipans greatly swollen under our sleeping mats. A great noise was made and at last it reached Mr Farquhar, who proclaimed a reward of 1 anna (wang) for each lipan killed. When the people heard this they began to search everywhere and brought great numbers, according to their various success, to claim the reward. By this means the lipans diminished in number, till at last every two or three days only 20 or 30 were brought. So the lipan disturbance and war also ceased, and people ceased to mourn from the pain of lipan stings.

Mr Farquhar consulted with the Tumonggong on the propriety of bringing Tuanku Long, the son of Sultan Mahomed, from Rhio, but they did not consider themselves justified in adopting this measure without the knowledge of Mr Raffles, who was at that time still in Bengal. After a few days, however, Mr Raffles arrived from Bengal, with 4 ships and 2 ketches. On his arrival Mr Farquhar and the Tumonggong went off on board to see him, he received them with great attention and kindness, they related to him every thing which had occurred, till at last Mr Farquhar mentioned about their desire to bring Tuanku Long from Rhio. As soon as Mr Raffles heard that Tuanku Long had not come from Rhio he was troubled, and directed that some one, in whom they had confidence, should be sent to bring him in three days, as till he arrived Mr Raffles would not land. On this Mr Farquhar and the Tumonggong went on shore and calling Rajah Ambong, a relative of Sultan Mahomed and of Tuanku Long, arranged with him in the Tumonggong's chamber that he should go to Rhio, that he should bring over Tuanku Long within three days, and that he should be careful not to allow the secret to get abroad, as the Dutch would not allow the Tuanku to leave Rhio, and finally that he should use every possible device to induce the Tuanku to come over to see Mr Raffles, who was waiting for him at Singapore. Rajah Ambong set sail at once in a ketch, and after a day and a night's sail arrived at Rhio, went ashore at the Tuanku's palace, and informed him that Mr Raffles and Mr Farquhar and the Tumonggong were anxiously awaiting his arrival at Singapore, in order to instal him as Sultan. Tuanku Long, who was alone, was very much surprised when he heard this news, and after bowing his head a short time in thought, sent for Inche Aboo, a person in whom he had great confidence, in fact he was his chief councillor, and was called Inche Aboo Puteh. When Inche Aboo arrived he was called into the chamber, and the three consulted long and anxiously, Tuanku Long could not decide, as he feared Mr Raffles wished to entrap him for the purpose of sending him to Bengal. At last, Inche Aboo and Rajah Ambong having given their opinion that no misfortune would arise from going, Tuanku Long agreed to go, and desiring them to prepare, secretly set out, going on board the ketch with only a box of clothes and without provisions, as they feared that the stir of making preparation would disclose their secret and the Tuanku would be detained. Orders were left for boats to follow with provisions and other necessaries to Singapore.

They set sail and Tuanku Long continued to turn in his mind all the circumstances of his being sent for by Mr Raffles, as he still feared treachery. The next day the sampan with provisions overtook them at Salat Lobam, and in two days they reached the Tumonggong's landing place at Singapore. The Tumonggong with Mr Farquhar went down to receive the Tuanku, and at the instance of Mr Farquhar, they went at once to see Mr Raffles on board his ship, but with many misgivings on the part of Tuanku Long. On the way to the ship a yellow flag was hoisted and as soon as this was observed on board preparations were made for the Tuanku's reception. When the boat got alongside Mr Raffles himself came forward to receive the Tuanku, and a salute of many guns was fired from the ships and ketches. Mr Raffles behaved with great politeness and respect to Tuanku Long, he led him to a chair, Inche Aboo Putih was seated behind, and Rajah Ambong a little further off. Mr Raffles commenced the conversation with his face wreathed in smiles, very sweet, and bowing his head, in short his conduct was sweet as a sea of honey. If a man's heart had been made of stone it must have melted from hearing the soft sweet words of Mr Raffles. His voice was like ravishing music, and calculated to do away with the anxiety and suspicions of ones innermost thoughts. As the raging sea, dashing against a coral reef, subsides, as the roving wind, in a dark tempestuous night, is succeeded by calm clear weather, with gentle odoriferous breezes, in the golden light of a full moon, so was the effect of the sincerity and candour of Mr Raffles on Tuanku Long. At once joy replaced grief, and his countenance was overspread with graciousness. As soon as Mr Raffles observed this change he rose and taking Tuanku Long by the hand, led him into a private cabin where they conversed together with the door locked, so that no one knows the subject of their conversation. After being thus closeted for some time they appeared again, both with smiling countenances, holding each other by the hand. They went into the boat, followed by Mr Farquhar, the Tumonggong, and the Captain of the ship with an armed party. They thus proceeded to the shore and landed at the Tumonggong's house. Tuanku Long retired to put on his royal robes, while Mr Raffles and Mr Farquhar, with the ship's people, and the Malacca men, placed themselves in order in the plain to receive him. A table was set with chairs right and left, and with a guard of seamen in line on the right and on the left. Soon Tuanku Long and the Tumonggong and Rajah Ambong appeared, followed by a large body of Malays, with a yellow umbrella. At this time by the will of God heavy rain fell, which in the ideas of the Malays, portended a fortunate result to the day's proceedings. Mr Raffles advanced to receive Tuanku Long, and taking him by the hand, led him into the tent. It was thought that even then Tuanku Long was in dread, as he was not yet satisfied that Mr Raffles did not intend, by deceit, to send him to Bengal. He directed Inche Aboo to walk close behind him, and on no account to leave that position. Mr Raffles placed him on a chair in the centre and stood himself on the right, with Mr Farquhar on the left, and all the other Europeans with their hats off and standing in order saluted the King. While this was going on a young Englishman appeared, with a cocked hat, surmounted by an ostrich plume and with a coat covered with gold braid, like a hulubalang. He advanced in the centre to the front of the table, and drew out 2 rolls of paper, one in English, and one in Malay. After making an obeisance he commenced to read the English paper; when it was finished, Inche Jayah came forward, and read the Malay paper, as follows. "Be it known to all that the Governor-General at "Bengal has raised Tuanku Long to be Sultan, and has conferred "on him the title of Sultan Houssain Shah Bin Almuhum "Sultan Mahomed Shah of Singapore and of the bays and rivers and provinces belonging thereto." On this all the Europeans saluted the Sultan, a salute of numerous guns was fired from the ships, and the Sultan and Tumonggong with Mr Raffles and Mr Farquhar, retired to the Tumonggong's house. Mr Raffles after taking leave of the Sultan, went on board ship. When left alone with the Tumonggong the Sultan directed him to build a palace for him as he intended to bring his wives and family from Rhio.

The next day Mr Raffles landed with all his things, and caused a house to be built for himself and his brother-in-law, Captain Flint, at the end of Singapore point, the site of Mr Johnston's Godown. Captain Flint was made Shah Bunder, Mr Farquhar built his house on the plain in front of the present Court House, and where Dutronqua's Hotel now stands. The houses were built with artap roofs and cajang walls. The senna trees which now grow on the plain were brought from Tanjong Kling at Malacca, in Rajah Hadje's prahu. After Tuanku Long was made Sultan, Mr Raffles presented him with a gift of 1,000 dollars, one piece of black, and one piece of yellow broad cloth, and fixed his salary ("Gajee") at dollars 416.25 per mensem, and the salary of the Tumonggong at the half of that amount or dollars 208.12½. On the same day an agreement was made between the English Company and Sultan Houssain Shah. In this agreement it was stipulated that the natives of India should be ruled by the English alone and the Chinese and Malays by the English in conjunction with the Sultan, and that any revenue collected should be equally divided between the Company and the Sultan. After concluding this treaty, and fixing the amount of the salaries, Mr Raffles took his departure for Bengal, leaving Mr Farquhar to act as Governor (Rajah), and having appointed Mr Flint to be Master Attendant (Shahbundar), and Mr Farquhar's son-in-law Mr Bernard to be Magistrate.

Singapore at that time was like the rising sun, the higher it rises the brighter it shines. Merchants from all countries poured in, partly to trade and partly to examine a new settlement. It is impossible to describe the wonderful variety of the goods brought for sale by the Europe traders, such as our fathers had never seen before. Every day the quantity increased, and auctions were held constantly, where the goods were sold wonderfully cheap. At that time the Auctioneer's gong was not beaten, nor was notice sent round to the several houses, the custom was simply to paste up notice at the several street corners, that to-morrow morning, at 10 o'clock, an auction would be held at Mr So and So's house, with a list of the articles for sale. The anchorage was crowded with ships, sloops, ketches, frigates, barques, schooners, Chinese, Burmese and Siamese junks, Borneo prahus, and all manner of vessels, and this at a time when there was not a single pucka built house in the settlement. All the houses were made with artaps, there was one however of brick, built by Mr McSween, who was the first person in Singapore who built a pucka house, he soon after returned to England, and the house was then used for the Police Office. Before that an artap house in the Tumonggong's campong had been occupied by Mr Bernard (the Magistrate) as the first Singapore Police Office. At this time people lived in constant fear, sometimes houses were set fire to, sometimes robberies committed in open day, sometimes murders. Every morning on awakening it was found that some one had been murdered during the night. The Sultan's and the Tumonggong's people and every one in fact went armed, and some of them used to rob in midday. Some entered houses and took the property of others. There was no check on them, in consequence of the settlement being without laws. There were but few Europeans, and no sepoys, while there were as yet only 4 or 5 Police peons. The Tumonggong's people every day caused disturbances, for they, with the Malacca men, were like tigers among sheep. The Malacca men had never carried arms, they did not know how to stab people, and in short were not accustomed to see human blood spilled on the ground. In any disturbances with the Malacca people, whether Chinese or Malays or Klings, Mr Farquhar always took their part, as he knew that among an armed people, they would not be the aggressors. These two parties were always at enmity, and frequently serious disturbances broke out without any reasonable cause; and if it were not that they were afraid of Mr Farquhar, there would have been murders among them every day.

In the fourth month of the establishment of Singapore, I arrived with Padri T———, from Malacca, and then there was not a single house on the other side of the river. The ground there was a mangrove swamp and the people all lived on this side of the river. The Sultan now wished to commence building his palace in Campong Glam, but the place was covered with jungle, and there was no road through it. If any one wished to go there he must have gone round by the sea beach, as people were afraid to go through the jungle, and indeed they feared also to go by the beach road. The Sultan's family, and all his followers, and relations, now arrived from Rhio, hundreds of boats bringing all their property; some of them went to live with the Sultan, some with the Tumonggong, while some settled in the interior. At that time there was not a day in which some one was not killed in Campong Glam. There were Police peons on duty and many of them even were killed, till at last Mr Farquhar employed coolies to cut down the jungle, and make a road through the Campong. Some people were employed in making the road and some in building houses for the Company, but all the people employed were Malacca men, and they congregated at the Tumonggong's campong, near the nibong fence. They built then a Madresseh, or place of prayer and round this were the huts of the Malacca men. The elder amongst them was Inche Yayah called Inche Siang. In the 8th month of the existence of Singapore the first fishing boat arrived from Malacca, the fishermen caught great numbers of parang-parang, for at that time fish were very tame, never having been caught there before. They fished about 20 or 30 fathoms from the beach. When the Singapore people saw the great profits made by the Malacca men in fishing, they also commenced, but they were at first acquainted with no other way of catching fish but by spearing them. At the end of the first year Hajee Mata Mata introduced the first fishing stake from Malacca. It was placed in front of Teluk Ayer, and the quantity of fish caught was so great that the people were not able to consume them and the fishermen at last commenced to preserve only the fish roe, which they salted and packed up for exportation. The Singapore people were astonished, and the fame of the fishing stakes at Tanjong Malang, at the end of Teluk Ayer, spread far and wide, till one day Mr Farquhar with all his sons and daughters went to see the fish caught. When they arrived at the net they found people shovelling the fish out; there were three rows; in the bottom row the fish were all dead, in the middle half were dead and half alive, while on the top all were living. When Mr Farquhar saw the fish he desired to catch some in his own hands, and his daughter also laid hold of one by the tail, but it shook its tail, and in a short time her hand became swollen and so they returned home.

Before the arrival of the Malacca people, the Orang Laut did not understand the use of oars in propelling boats, they used only poles and paddles, and had no opportunity of learning better. Very few boats with oars passed there, as the strait was famed as a nest of pirates. They now introduced oars, like those used in the Malacca boats. It is true that before this they had in their larger boats, oars, but these were sweeps or Malay oars, not to be compared for strength to the Malacca oars in pulling. They had also no clothing, either man or woman, except a small piece of cloth of no colour, (dirty) which they wore round their loins. They were not accustomed to build houses for themselves to live in on shore, but spent their whole lives on board their boats. For this reason it is that, when on shore, male and female, they are easily known by a rolling gait acquired from their constant habit of sitting in their boats. As to religion, they have no religion: it is true they are called Malays, but they do not attend to the requirements of religion.

From the time Singapore became a settlement, these people took to wearing Europe coloured cottons for robes, broad-cloth for trowsers, bright Bugis sarongs, battick handkerchiefs on their heads, and some of them wore shoes and carried silk umbrellas in their hands. They spoke English and Bengali and Tamul, like water. If an Englishman addressed one of them in Malay, he answered in English. I was quite surprised to see such changes in the world; what is, made not to be; and what is not, made to be; jungles turned into cities, and cities turned into jungles. Such things as these point out that this world and its pleasures are not lasting, but rather like something borrowed, which, when its owner requires it to be returned, must be given up.

Let us now return to the affairs of Singapore and of the Sultan. Ever since Mr Raffles had sailed, the Sultan had received his regular monthly salary, as had been settled by Mr Raffles; as in like manner had the Tumonggong. The Sultan said his allowance was not sufficient for him, as he had such an immense number of people to support; and he now represented to Mr Farquhar the narrowness of his means. Mr Farquhar desired him to take the proceeds of the opium farm, to make up the deficiency. This brought in 800 dollars, or 1,600 Rs a month, and with this he was contented for some months, till Mr Raffles returned from Bengal. At this time merchants and traders flocked to Singapore. Her number of white people increased, and it was known far and wide that this settlement of Singapore had succeeded. Many settlers in other countries removed to Singapore, and many sent agents, to whom they consigned goods for sale. The place became populous and was crowded with all manner of people, who followed different trades and occupations. At that time there were those who rose from poverty to riches, while others who brought with them tens of thousands of dollars worth of property, became paupers, according to their several luck.

One day the Sultan spoke to Mr Raffles, who was at that time sitting with Mr Farquhar, and the Tumonggong and his people, concerning his pecuniary wants. Mr Raffles after considering a short time, replied, addressing the Sultan and the Tumonggong—"I have an idea, which will, I think, prove profitable to the Sultan, and will also render famous the name of the Sultan and of the Tumonggong. I have a very rich friend, a merchant, in Bengal, in fact the chief of English merchants, his name is Mr Palmer. I propose to write to request him to send down goods to the Sultan, to sell on commission for him, he will send down as many hundred thousand dollars worth as the Sultan wishes. I will also give money, and furnish plans, to erect suitable premises to carry on the business, in the same way as the English merchants do. I think it is quite clear that all the people in this part of the world, as Bugis, Malays, Borneo people, &c., would prefer trading with the Sultan, to trading with white people, or Klings, or Chinese." When the Sultan and Tumonggong heard this speech they laughed and said, such is not the custom, for Malay princes to trade would be a disgrace for them. The countenance of Mr Raffles' altered when he heard this, and became quite red, however he replied smilingly, "I am astonished "to hear of such a foolish and improper custom; to trade is a "disgrace, but to pirate is not a disgrace." The Sultan replied, "pirating has descended to us from our fore-fathers, and therefore "it is no disgrace; and furthermore pirating has not its origin "with Malays." Mr Raffles on this said, "very well, if you "please let us drop the subject, and now you and the Tumonggong can consider what sum will be sufficient for your monthly "expences, so that you may no longer be uneasy on the subject." After a short time Mr Raffles enquired if they had decided, but they returned no answer, till he had asked twice, when Inche Aboo Putih said, "in my opinion 3,000 dollars will be sufficient." Mr Raffles said, "10,000 dollars would not be sufficient, if it is spent unwisely," and addressing the Sultan, continued "better go "now with the Tumonggong, and consider the subject well, and "let me know in a day or two."

When Mr Raffles came from Bengal, he presented a Calcutta buggy and a large horse, of the value of 1,200 Rs to the Sultan.

At the end of three days the Sultan and the Tumonggong followed by all their people, came to Mr Johnston's house, where they found Mr Raffles, Mr Farquhar and Mr Flint, Mr Raffles's brother-in-law, and there it was arranged that the allowance of the Sultan should be 1,000 dollars a month, and of the Tumonggong 700 dollars a month. These rates of salaries (gaji) or allowances ("balanja") were adhered to since then, till Mr Crawfurd's time.

Mr Raffles and Mr Farquhar consulted together and wished to enlarge the size of the settlement. Mr Farquhar was of opinion that the mercantile buildings and markets, &c., ought to be on the Campong Glam side, while Mr Raffles thought they ought to be on this side of the river. Mr Farquhar argued thus, "on this "side of the river the traders will meet many difficulties, for the "place is a low swamp, with bad water, and the expence of "raising the levels of the ground will be very great, besides the "difficulty of getting earth for filling up." Mr Raffles said, "if the Campong Glam side is chosen this side of the river will "be deserted, and will not be settled for a hundred years." At this time they were both full of projects and ideas on the subject, one said this and the other said that, till three days afterwards, as they were thinking over the matter, it struck Mr Raffles that he could break up the hill at the end of Singapore point, and with the material from it, fill up on this side of the river. The next day they met, completed their arrangements, and sent for coolies to commence the work, greatly to the surprise of every one. Two or three hundred coolies, Chinese, Malays and Klings, were employed at the rate of a rupee a day each man, chankolling and carrying earth. Some were breaking up the rocks, of which there were very many in the hill. Every one was employed at his own allotted work, and there were tens of tindals overlooking them, labour became dearer, although every evening bags of money were brought, and each man, who had been employed during the day, got his payment. Mr Raffles came twice every day to give directions about the work, besides there were numbers of people employed as overseers.

Every morning Mr Farquhar rode out to sell and portion off lands at a distance. Some lands he sold by auction, and some he gave for nothing, in order that it might be cleared quickly, for land was at that time all covered with jungle. One day Mr Farquhar advised me to buy a lot of ground in Campong Glam, for ultimately, the traders would congregate there, so I took a lot, and built a plank house, with an artap roof, but I lived there in terror, as the place was surrounded by jungle.

After about 3 or 4 months the hill was completely cut down, and all the hollows, and streams, and drains, and valleys filled up. There only remained one rock about the height of an elephant, but a great deal larger than an elephant, this rock was much sought after by Chinese, for building purposes, and its removal cost nothing, as they agreed to cut it down, on getting the stone for their trouble.

At the end of the point there was another rock found among the brushwood, it was smooth, of square form, each side about a fathom in length, and all covered with a chisseled inscription, which no one could read, as it had been worn away by water, for how many thousands of years God alone knows. As soon as it was discovered, people of all races crowded round it. The Hindoos said it was Hindoo writing but they could not read it. The Chinese said it was in Chinese character. I went among others, accompanied by Mr Raffles, and Mr Thomsen. I thought, from the appearance of the raised parts of the letters, that the character was Arabic, but I could not read it, as the stone had been subject to the rising and falling tides for such a very long time. Many clever people came, bringing flour and lard, which they put into the hollows and then lifted out, in the hope of getting the shape of the letters. Some again brought a black fluid, which they poured over the stone, but without success. Ingenuity was exhausted in trying to decipher the inscription. The stone remained there, subject to the flow and ebb of the sea, till lately. Mr Raffles said that the inscription was Hindoo, because the Hindoo race was the earliest which came to the Archipelago, first to Java and Bali, and Siam, the inhabitants of which places are all descended from Hindoos. But not a soul in Singapore could say what the inscription was. During the time Mr Bonham was governor of the three Settlements this stone was broken up by the Engineer. This is very much to be regretted, and was in my opinion highly improper ; perhaps the gentleman did it from ignorance or stupidity, and now, from his conduct, we can never know the nature of this ancient writing. Did he not think that persons sufficiently clever might come and disclose the secret, so long concealed ? I have heard that in England there are persons very clever in deciphering such inscriptions, with the aid of all manner of curious devices. Well may the Malays say " what you can't make don't break."

After the low marshy land was filled up, raised, and embanked, it was measured out into lots, and sold by auction. If any one wishes to know the locality of the hill, which was thus removed by Mr Raffles, to fill up ground on this side of the river, it was at the end of Singapore point, at the place now called Boat (Quay ?) Street. It was at first made into a garden, and all manner of flowers and trees planted. I recollect hearing formerly that this spot was chosen as a site to erect a building, in which to place the portrait of Mr Raffles, as a memento that it was he who had formed the Settlement, but for some reason unknown to me, this project was not carried out, and the place now remains a garden, opposite the house of Messrs Spottiswoode and Conolly.

When they were selling this ground Mr Raffles advised me to buy 4 or 5 lots, as afterwards this part of the town would become valuable, but I answered, where could I get enough money to pay for the land. I saw the lots selling at auction for 1,200 and 1,150 dollars, and besides the expense of building, how can I provide for such payments as those. When Mr Raffles heard me, he smiled and said, never mind about the money, take the land first, and we can talk about the payment hereafter, but in my stupidity and want of judgement, I thought of the difficulty I might experience if I got into debt, in case I wished to return to Malacca, and besides money at that time was easily earned in Singapore, in fact so much so I made it a rule to go home to Malacca every 6 months and if I should buy land and build houses, I would not be able to go home, and in fact I really did not think, at that time, that the Settlement at Singapore would succeed. Before that, I was not aware that the land sales were mere formalities, and that the price of the lands was not paid, and I saw at once the deep cleverness of the idea. If Mr Raffles was to give the land for nothing, all manner of paupers would quickly come and take possession, and when could he expect to see puckha houses rising. On this account he put the land up at such high rates that none would buy but wealthy people, who could afford to build proper houses. It was solely on account of my own stupidity and want of judgement, that I lost this opportunity of purchasing land, by following Mr Raffles's advice, and I now repent, but what is the use of that; as the Malays say, "repent before you do a thing, for it is of no use afterwards."

Shortly after that Mr Raffles removed to the top of Bukit Larangan. As a great many Europeans wished to build there, orders were given to clear the jungle all round the hill. In performing this work they found numbers of fruit trees, of all descriptions, such as durian trees, that two men could barely girth with their arms, so extremely old were they. There were also dookoo trees, orange trees, langsat trees, and trees with bad smelling fruit, as the pasti and jerring.

Mr Raffles's manner of life at this time was the same as I have already described, when he was at Malacca. He retained four persons, at monthly wages of ten dollars each, whom he employed in collecting specimens of all manner of curious and valuable articles, and in Singapore he obtained more valuable additions to his collection than he did at Malacca.[*]

Concerning Mr Raffles.

A few days after this news arrived at Malacca that the English intended to attack Java, and two or three months afterwards came Mr Raffles with his wife and a European clerk named Mr Merlin, a Malay cranny named Ibrahim, a jawee puckan from Pinang. Mr Raffles resided in Malacca in the garden of Baba Chang Ling, the son of the Capitan China, at Banda Hilir. He brought with him a very valuable selection of goods of all kinds, all sorts of European manufactures, boxes, pistols, fine and valuable cloth, cloth flowered with gold, all manner of things which had never been seen at Malacca, fine broad cloth, valuable watches, also paper ornamented with gold and silver, on which to write letters to Malay princes, and besides these how many different kinds of things to present as gifts to the Malay kings.

---

[*] The description of Mr Raffles, alluded to by Abdullah, is here given. It contains a portrait of the man, which is said, by those who knew Sir Stamford, to be as faithful as it is striking. This chapter finishes with an account of the loss of one of Mr Farquhar's dogs, which was taken by an alligator, one morning when Mr Farquhar was at the Rochor river. The alligator was surrounded and killed, it was three fathoms long, the body was hung on the banyan tree at Bras Basah.

Now one day Ibrahim, the cranny, came to my house and said that Mr Raffles wished to get a Malay cranny, who could write a good hand,—that he, Mr Raffles, wished to buy all manner of Malay books and stories of former times, and whoever wished to sell these sort of books might bring them to Mr Raffles's house. There was a man named Ismail Lebby, who was an exceedingly good writer, he and his younger brother Mahomed Latiff, were both taken at once into employment. On the next day they came also to get a specimen of my handwriting, and in the evening a peon came to call me. On arriving in Mr Raffles's presence, he said, "Inchi, let me see you write a letter in this book." There was a friend of mine named Tomby Ahamed ben Nina Merikan, a Malacca man, he was employed in writing on various subjects, translating histories, writing out letters, writing on the Malay language and poetry &c.

Now with regard to the character of Mr Raffles, I observed that he was of medium height, not very tall, nor yet very short, not stout, nor yet thin, his forehead was broad, a sign of a deep thinker, his front head was round and full, a sign of intellect, his hair was of a light brown colour, a sign of bravery, his ears were large, a sign of quickness of hearing, his eye-brows were bushy, and there was a slight squint in his left eye, his nose was long and projected, his checks were a little dried up, and his lips thin, a sign of a good orator, his speech was sweet, his mouth wide, his neck was long, his complexion was reddish rather than fair, he was deep chested, his waist was slight, his feet were of middling size, and he walked with a strut. He was moreover always in deep thought, he was exceedingly polite in his demeanour to all, he had a sweet expression in conversing with European or Native gentlemen, and he had great consideration for every one, his hand was always open to the poor, he was very clever in conversation, his arguments were unanswerable. He always spoke smilingly, he was very apt in enquiring and examining into all affairs of old times, and if he heard anything about ancient history, he was not satisfied till he had probed and examined it to the last degree. He always liked to remain in a quiet retired place, where he did nothing but read and write; when thus engaged, no matter who came to his house, he refused to see them till he had finished. His labours were arranged regularly, he never permitted one subject to get mixed up with another, but he set apart a time for each. His custom at night was this;—after drinking tea with his friends, his writing materials were laid out ready on the large table, where there were two candles lighted, and when he was tired walking up and down the room, he would take a chair at the table and lean back, with his head raised and his eyes shut, as if asleep (in fact on two or three occasions I thought he was asleep)—when thus engaged deeply thinking he would suddenly start up and write something on the paper before him, and then fall back into his former position. He continued thus employed till 11 or 12 o'clock, when he went to bed. This was his custom every day, except occasionally when he received his friends. When he rose in the morning, he took the sheets which he had written over night, and while walking up and down the room would read them, and perhaps out of 10 sheets he would hand over 3 or 4 to his clerk, to be copied into his book, and the rest he would tear up, this was his custom every day.

THE

JOURNAL

OF

THE INDIAN ARCHIPELAGO

AND

EASTERN ASIA.

NOTICE OF THE RELIGION OF THE CAMBOJANS.

Extracted from a Manuscript of Monsigneur Miché, Bishop of Dansara, by the Bishop of Isaùropolis.

The principal sources from which I have drawn this notice are the Sătra Trayphum and the Sătra Pâpithŏm, two works much revered and which are of the number of the sacred books of Camboja. The reader may therefore reckon on the accuracy of the citations, which are only intended to form a notice of some pages. I have confined myself to that which is the more substantial in the Cambojan theology, and have abstained from speaking of the superstitious practices of the country, which would have led me a long way.

Article 1st.

Of the Divinity worshipped by the Cambojans.

What is Budhism, considered under the forms in which it presents itself in Camboja? It is nothing else but a vast and absurd Pantheism, which covers with its veil a hopeless atheism. This religion deifies the whole of nature. The four elements, *water*, *earth*, *air* and *fire*, are all divinities. The sun, the moon, the planets, the sea, and even the rice which grows in their fields, in consequence of their labour and industry, are also Gods. Such is Pantheism, properly characterised! It is true that above all these divinities the Cambojans place Budh, who is known and worshipped in that country under the name of Sâmonacudŏm. But this is still a corporeal God; so that it may always be truly said that the Cambojans do not accord the honors of divinity except to creatures, beings purely accidental, who have not a single attribute of the true God. It may be said at the present time of Camboja, what Bossnet said of the ancient pagans, that all there is God, except God himself. At bottom, therefore, this religion is nothing but a disguised atheism

From this it is easy to conclude that the Cambojans have not a single sound idea of the Divinity. Sâmonacudŏm, their principal God, who receives their daily homage, is not in their estimation the *first cause*, nor the Creator of every thing; since he is simply a man, and besides they do not admit the creation. His reign has had a beginning, and it will have an end, like that of other Gods who have preceded him; so that he cannot claim the attribute of an eternal being any more than that of a creator. Tivĕatŏt himself, the younger brother of Sâmonacudŏm, who has been in hell for many ages for having persecuted his elder brother, is also destined one day to become a God. Further, they expect Prĕa-Sreyar, who is immediately to succeed Sâmonacudŏm, after a certain number of years clearly defined in their sacred books; and from that time forward Sâmonacudŏm will no longer receive the adoration of mortals, but only the new god.

Sâmonacudŏm is not supposed to occupy himself with the events of this world. The Book Tray-phum represents him in heaven as wholly engaged in preaching from morning till night, as he did formerly when a Bonze; from which we may conclude that they deny to him the attribute of Sovereign Providence. Neither can he pretend to omnipresence, for he is corporeal. His body, colossal though it is supposed to be, resides only in the Nirpeăn. The Cambojans would say that if he is not everywhere in his essence he is so by his knowledge, but that is not sufficient to constitute omnipresence.

It may be thought they will at least make him a being supremely just. But to recognise in him this virtue it ought to be seen in practice, and he should manifest it by his acts, whether in rewarding the virtuous or punishing crime. Now he does neither the one nor the other. The laws by which mortals are admitted to the abode of happiness do not owe their existence to him. They were in existence before him;—and he himself entered the Nirpeăn only by virtue of these laws. He does not therefore award the recompense of the just. But does he not, at least, punish the wicked? No more this than the other. For we read in the book Tray-phum that after death the wicked appear before the supreme judge Côm-réach who recounts before each the sins which he has committed, and when the guilty seeks to excuse himself, a certain *Prĭa-chŏt daloc cabal* takes a great book of dog skin in which are written the crimes of the living and reads from it. Then the sinner acknowledges his guilt and the judge *Cŏm-réach* delivers him over to executioners of hell, known by the name of *Com-phubal,* who torment the damned in the various stages of the infernal regions, according to the number and weight of their crimes. If then all this passes without the knowledge or privity of Sâmonocudŏm, this question remains,—if the God of the Cambojans interferes not in the distribution of rewards to the just, nor in the judgment, condemnation and punishment of the wicked, what kind of God is he? He is a feeble mortal, like those who worship him. Born in Ceylon of a father called Strey-suthut and of a mother named Néang Meia, transformed into a beast for his sins he passed through the shapes of a bird, a reptile, a fish and a quadruped. Restored to human shape he was a king and a shepherd, and after a very great number of transmigrations became at last a Bonze. It was in this last state that he became sanctified by the exercise of charity, drawing others to virtue by preaching, cutting off his flesh in pieces, tearing out his eyes to give them as alms, and opening his veins that the birds might drink his blood. As the reward for so much virtue he was admitted to the Nirpeăn, where he reigns in empty divinity, contented to enjoy his happiness in quiet, and troubling himself very little about the joys or sorrows of others.

Sâmonacudŏm has figured among many kinds of animals in the course of his metamorphoses. He became an ape, and was one day surprised by a tiger which seized him in his claws, tore him to pieces and devoured him. At another time, while in the shape of a small and pitiful hare, he imposed his authoritative commands upon a tiger, which obeyed him. But he does not appear to have always possessed the same power, or at least, he did not always use it. At last, however, when he was a *Talapoin* (priest) and had a great number of disciples, these filled with affection and respect for their master invited him to a feast, and set before him some pork. But unfortunately the soul of a giant whom Sâmonacudŏm had formerly slain had entered into the pig of whose flesh he had partaken, and Sâmonacudŏm died. Such is the god who is worshipped in Camboja.

The sacred book of the Cambojans ranks man in the same class with the brutes, offering no variety or difference except in their physical constitution. When the damned are spoken of they are always designated by the word *Săt,* which signifies *beast.* But what do I say? The inhabitants of heaven, whoever they may be, are also all of them comprised under this general denomination, and it is but very rarely that the word *menu'a,* which means "man" is used towards them. On the other hand they apply to to the beasts the numeral of man *nĕac.* What wonder then that men and the beasts have according to them the same destiny and the same hope.

According as the soul advances towards perfection it becomes more and more divinified,—or to speak more clearly, it clothes itself with privileges which appertain only to divinity,—such as the knowledge of the future, of the inward recesses of the heart &c. Once arrived at the point of perfection it quits this earth, which is no longer worthy to possess it, and takes its place in the *Nirpeăn*, body and soul. Such is the new master of the world who is worshipped under the name of *Preă-pŭt*.

It is astonishing they should not perceive that this divinity during its pilgrimage on the earth receives foreign aid, enabling it to conquer its passions and to advance in virtue. Its sanctification appears to them to be the work and the fruit of its own unassisted efforts. And when it assumes the possession of sovereign power in the *Nirpeăn*, the highest height of dignity and most glorious reward of virtue, they perceive no other being raising it to that dignity.

The statue of Sâmonacudŏm is in every pagoda, and is called simply *Préa*, or *Préa-pŭt*, which means God. In proportion to the grandeur of the pagoda, the statue is formed of bricks or stones, and is of gigantic proportions when the place permits it; if not, it is but the sculptured trunk of a tree or a casting of copper or brass. It is wholly gilded over, and is placed upon a grand altar, the legs crossed, the hands extended and resting on the thighs. The ears are long, pierced, and fall on the shoulders, and the head is covered with a cap which terminates in a point covered with roughnesses, or rather points resembling the rind of the fruit known as the durian. In the grand pagoda are always to be seen a great number of small statues, ranged in a line at the feet of the principal statue. These statues, which are offerings to the pagoda from the devotees of the district, and which are sometimes of gold or silver, also represent Sâmonacudŏm. Should any man be convicted of stealing one of these small statues the penalty of the profane act is death.

Here the question naturally presents itself whether the Cambojans worship the statue itself which they know to be merely a piece of wood, stone or metal; and from what I have myself seen, I think they certainly do. The ignorant vulgar attribute a divine virtue to that mass of inert matter, and believe that its eyes see their offering and its ears hear their prayer. One statue is reputed to excel another in power. That in the great pagoda at Angcor for instance, and that at Kien-xoai, are in greater estimation than the one at Pĕnompenh, and attract crowds of worshippers. Among persons of rank and wealth, however, I have met some (the king amongst others) who pretend that the homage rendered to these mute statues is carried to the hidden person of Sâmonacudŏm himself who resides in the Nirpeăn; but as the very limited number of those who think thus is composed only of men of more enlightened understanding than the multitude, and who have had intercourse with Europeans, there is every reason to believe that they have derived their ideas upon this point from missionaries, and that their belief is not in accordance with that of the mass of their co-religionists.

ARTICLE 2nd.

Of Heaven and the Angels.

The Talapoins (priests) according to their holy Book divide heaven into different stages, the one placed above the other. Their Nirpeăn is above all. There dwells their Prĕa-pŭt with all his court. I have not been able to learn whence they derive their singular predilection for countries to the northward, and particularly the mountains of Thibet. But it is there they place their land of delights and their earthly paradise, which still exist. There too, in the corresponding region of heaven, are the different stages or kingdoms of heaven inhabited by the angels and the blessed.

"In the neighbourhood of Thibet" says the Book Tray-phum (Chap. 3.) "are several kingdoms, one of which is 9,000, and " another 80,000 leagues in extent, each containing 500 countries " dependant upon them. That happy land abounds in gold, silver " and precious stones. There is neither height nor depth, but the " whole like the surface of a drum. Its inhabitants enjoy unmingled " happiness, none are diseased, blind, deformed or paralytic among " them, because they eat wheat instead of rice. The earth produces " spontaneously all that is necessary for the food of man. The " wheat is baked in golden vessels, which are placed upon a stone " that ignites of its own accord, and when the bread is cooked the " fire vanishes. The bread has to each the taste he likes best. " The men and women are equally beautiful. They are neither " young nor old, but all appear to be of the same age, viz. nearly " 20 years. The words " mine" and " thine" are unknown, and " every thing is in common, for every thing is equally precious. " The women bear their children without pain, and have no " trouble in rearing them. They place them in the middle of the " highway, and the passengers put one of their fingers into the " mouth of the newly born infant from which it draws milk. In " seven days from birth the child is great and strong and can " provide for itself. Nevertheless men die in this land of bliss, " but its earth is never defiled by the burial of a dead body. " A bird, which some call a partridge and others an eagle, takes " the dead body on its back and carries it across the sea, or " sometimes into this country. The inhabitants never leave this " blessed abode to go to hell, but only quit it to enter heaven." Such is a sketch of the wonders which even at this day are supposed to be at the foot of the mountains of Thibet near the Arctic Circle. There, then, is the earthly paradise.

In the region immediately above the last, but still below the mountains of Thibet, are situated the different heavens, containing the blissful abodes destined to reward virtue, and the higher the stage the greater the degree of virtue necessary to attain to it. Each stage is a separate kingdom, governed by an angel who is king of it. This angel, as well as those under him, have formerly passed through various transmigrations upon this earth, and by virtue and good works have at last merited a place in this fortunate realm. But this happiness is not to be everlasting, for they must one day leave this celestial abode to be born elsewhere. Each of these kings of angels wears a chain of diamonds, gold, or precious stones. Besides the richness and splendour of his palace which distinguishes him from all his subjects, he is endowed with gigantic size and strength, of which the following is an example:—"The Angel Reahn, king of Asôr is 5,800 "leagues in height, and his head is 9,000 leagues in contour. The "width between his right and left shoulder is 1,800 leagues. The "trunk of his body is 3,000 leagues in height. His nose is 300 "leagues long and his chin 70 leagues. From one eye-lid to the "other is 200 leagues. The hollow of his hand is also 200 leagues "in extent, his mouth presents another cavity of 200 leagues, and "his wrist is 2 leagues in bigness,"—*ab uno disce omnes!*

These Angels are by no means pure spirits. They are of both sexes, and their joys for the most part consist in carnal pleasures of which decency forbids the mention. They have the passions and failings of men, and there is no doubt that their filthy intrigues form the source of Cambojan theatrical representations. It appears, however, that in the higher stages of this heaven, those that are near to the Nirpeăn, the most blessed of the Angels have not any material body, or at least "if they have" says the sacred Book Trayphum "it is the same as if they had not, for they "possess only a heart. The happiness of these rather resembles "a sleep than true pleasure." But let us leave these angels and their obscenities, and pass on to hell, where we shall find victims less worthy of punishment than these dwellers in heaven.

ARTICLE 3rd.

Of Hell.

The hell of the Cambojans, like their heaven, is divided into several stages or compartments. These are contiguous and situated one under the other in the centre of the earth which we inhabit. We find eight principal or great hells in which the condemned undergo their several punishments, according to the number and atrocity of their crimes. The more distant the hell is from the surface of the earth, the more severe and prolonged are the torments there inflicted. The deepest hell is called *Nŏrôc avichey*, and according to the Talapoins, the punishments there inflicted are everlasting, while in the other seven they are only temporary. That nearest the earth is called *Sânhip Nŏrôc.*

The wretched beings who are here, expiate their faults by suffering horrible torments for 500 years. But, says the text of the sacred Trayphum, these years have nothing in common with ours, for one day and one night in this hell is equal to a period of 900,000 years such as we count them on the earth, whence it follows, adds the author, that these 500 years of torment are equal to 162 000,000,000 of our years.

In the second hell the duration of punishment is 1,000 years; in the third it is 2,000 years; in the fourth 4,000 years; and so on, always doubling as we pass from one hell to that immediately below it. A day and a night, however, is not in every hell equal to 900,000 of our years, as in the *Sânhip Nŏrôc*, but goes on increasing as we descend. Thus the 1,000 years in the second hell are estimated at 1,296,000,000,000, and we may judge by this what is the term of punishment in the stages nearer the bottom. In fact the several hells, with the exception of the last, are only purgatories, seeing that the punishments in them are not eternal. We might expect that this lengthened period of threatened torment would be enough to terrify the imagination and restrain the sinner. But it is not so. Nothing is more common than to hear the Cambojan say that he will go to hell, but he consoles himself by adding that he will get out of it some day!! So true is it that an eternity of punishment is necessary to offer a sufficient obstacle to the torrent of vice. Some of these great hells are as it were surrounded by others of smaller dimensions which form a sort of appendages or dependencies to it. Of these there are 16 which are each 10 leagues in extent and are themselves again surrounded by others still smaller, of which the number is incalculable. The more spacious adjoining the great hell are 136 in number.

We have seen above that the supreme judge of hell is called Côm réach, and that he delivers over the victims to those appointed in each hell to torment them. These tormentors are men who at the time of their appearing before Côm réach have been found to deserve both punishment and reward, because their good deeds when thrown into scale have served to counterbalance their sins. In consequence of this they are condemned to suffer for 15 days with the damned among whom they are placed, under the cruel treatment of other tormentors, or Côm-phubal as they are called. This is by way of punishment for their sins:—but as they have wrought good works as well as evil, whenever these 15 days expire, they become Côm-phubal themselves during other 15 days, and in this quality they not only cease to suffer but enjoy happiness, possessing wealth in abundance, and tormenting others in their turn. Thus they alternate for a certain period of time until they have expiated all their faults, after which they are removed to be born into a new existence somewhere else.

I shall not pause here to describe the kind of punishment peculiar to each hell,—as that would lead me beyond the limits I have prescribed to myself. Whoever has read the Inferno of Danté may be able to form some idea of the torments reserved for the wicked in these hells of the Cambojans, except that there is no justice to proportion the punishment to the crime. I shall content myself with extracting a few lines relating to the 9th of the 16 hells above referred to, and which is called *Pilĕăc nŏrŏc.* " There the Côm-phŭbal take a chain of red hot iron which they " fasten round the neck of the condemned sinner, then drawing it " quickly with a jerk their victim falls upon a red hot gridiron. " Here they incite one another to the utmost and strive in the " infliction of cruelty. Armed with swords, spears and sharp " knives, they pierce, cut and tear in pieces the body of the guilty, " just" says the sacred book " as a butcher dismembers the animal " whose flesh he sells. Now this hell" continues the author "is the " abode of those who have caught fish for the purpose of selling " them or using them as food, or who have killed oxen or buffa- " loes to sell their flesh." So that it was not without good reason I said we would find as victims in hell those who are less worthy of punishment than the inhabitants of heaven.

When placing the killers of beasts in this hell the author had doubtless forgotten that he had already disposed of the same sinners in another where the punishments are quite different. For the rest it would seem that his imagination had exhausted itself on the pomp of the foregoing description and was unequal to the task of graduating the punishment according to the heinousness of the crime. After thus torturing the slayers of animals in the 9th hell, he contents himself with placing poisoners and parricides in the 11th where they are plunged into rivers of blood which they are obliged to drink and to feed upon worms; evidently a much more lenient punishment.

In general the severest punishments are reserved for those who have killed animals, or who have despised or injured the priests or given to them only remnants as alms, witholding the better parts; and it is often doubtful for which of these two sins the punishments are denounced. This little peculiarity runs through the whole. For the same reason, and always with the same object, the sacred book makes continual digressions to inculcate good works and abounds in fables extolling their rewards. But these good works invariably resolve into that *one* which we meet in every page, viz:—giving alms to the priests. The rich are not required to disturb themselves about the wants of the poor. The priest absorbs all. Although it does not exactly belong to the subject of this article, I shall give here one of those tales from the sacred book, in order to shew how meritorious it is to give liberally to the priests, abridging only the miracles which are without number.

"A women named Néang Cumari had 500 children in one of " her transmigrations, and 500 in another, because she gave to a

"Talapoin a bowl of rice. One day as she went with her husband's meal of rice to the fields where he was labouring, she "was met by a Talapoin. When she had prostrated herself with "deep respect before the priest, she poured into his wallet the "dinner of her husband who was obliged to starve for that day; "and after her death she was carried to heaven for this good work "(or, as we might more truly say, for this sin). After enjoying "the pleasures of heaven for many ages she returned to the earth; "but as she was averse to spending nine months in the womb of a "mother, she was born in the calix of a flower of Nénuphar in "the centre of a pond. A great Talapoin who was accustomed "to bathe in this pond observing that this flower did not unfold "itself like the rest, considered it attentively and discovered that "it contained a charming infant. He plucked the flower and "carried the child to his cell. Every day he placed his finger in "the child's mouth from which it sucked milk. The little Cumari "grew up. The report of her beauty reached a great king in the "neighbourhood who took her into his harem. The miracles "which she performed revealed her virtue, and the king put her "above all the women in his seraglio." Such were the rewards given for bestowing a bowl of rice upon a priest to the prejudice of her husband, who died of fatigue and hunger. The other tales may be judged of by this specimen. The Cambojan is so little accustomed to reflect, that the recital of these absurdities instead of opening his eyes, puts him into ecstacies of admiration. This digression has been somewhat long, let us return to our subject.

In the book which treats of the nature and happiness of the angels, as well as in those which speak of hell, one is surprised to find no mention of the devil, a proof that they are ignorant alike of his celestial origin and present condition. Like all other nations of the world the Cambojans look upon the devil as a wicked spirit, whose sole occupation is to deceive mortals and render them unhappy. Their religion also forbids them to yield any honor to him. But as fear predominates in them above every other feeling, it may be said that he receives a greater share of their homage than even Sâmonacudŏm himself; particularly in seasons of sickness. The doctor never approaches his patient to administer his medicine without first addressing the devil. In fact it may be more truly said of him than of their idol, that he is the king of Camboja. This is without doubt the reason why he possesses such a hold upon their minds, and why it is so difficult to withdraw them from his dominion to place them under that of the Redeemer of Men. It is part of their popular creed that the souls of great criminals and persons who have died a miserable death are transformed into devils to torment the living. These are called *Arăc Khmôch*.

ARTICLE 4th.

Of the Metempsychosis.

It is known that the nations who believe in the transmigration of souls, do not admit this doctrine on the same conditions. Some think that at the moment of death, the soul of a dead person neither goes to heaven nor to hell, but that it immediately passes into another body ready to receive it. According to this doctrine, the birth of a 100 infants or of a 100 animals is a dooming to death of as many others, for when a being of whatever kind is on the point of receiving life in the womb of its mother it is necessary that a soul should quit another body, in order to inhabit the new one which is prepared for it. It would be making a great mistake if we entertained this idea in conversing with a Cambojan. For, as may easily be inferred from what we have before said regarding heaven and hell, the Cambojans believe and understand that souls in quitting the bodies which they inhabit upon earth go to be born, as they express it, in heaven or in hell. When they have enjoyed in heaven a degree of happiness equal to the merit of their good works, and when they have undergone in hell the punishment proportioned to the gravity of their faults, they then return to occupy new bodies on earth. These are the bodies of men or of animals; they are large or small, strong or weak, beautiful or ugly, perfect or imperfect, according to the greater or less merit of the soul in the preceding transmigration. A proof that such is the doctrine of Budhism in Camboja and that innumerable years elapse between one transmigration and that which follows, is that the Cambojans agree in saying that it is impossible to recognize their parent amongst the living, because the souls with which they are provided had quitted this earth a very long time previously. But this general rule appears to have many exceptions, and I do not see on what reasons they are founded, nor how they can be reconciled to the doctrine which I am going to state. For—1st, it is a belief generally credited in Camboja, that a great number of souls, after quitting their bodies, wander about amongst the forests and thickets;—2nd, in the most part of their maladies, believing that the soul of a dead person is entering into the body of the patient, and ought to be considered as the cause and origins of the sickness, they have recourse to sorcerors and talapoins to drive away this soul;—3rd, on a certain day at a certain epoch, one cannot pass by a certain road without being exposed to be molested by the soul of the dead;—4th, we read in the Trayphŭm (chap. 4) that "whoever shall drink wine will be thrown into hell, then on his coming out of that place, he will be born *to khiney* in 500 transmigrations; a *dog* in 500, and foolish or mad in 1,000 others, and if he is ever born a man, he will not be foolish, but shall have a frightful body. He shall be a boorish man, ignorant and rustic, neither marked by good nor evil." These words seem to imply that all these transmigrations will be successive, although they do not state so explicitly. Wherefore, then, do certain souls, although sinful, not undergo the common law which condemns all sinners? I see here a contradiction in doctrine and a palpable inconsequence, whatever reasons the doctors of the country allege to reconcile them.

It will be perceived that the preceding passage overturns completely the doctrine of Budhism regarding the Metempsychosis. According to this doctrine the souls of beasts enjoy the same faculties as ours; they are therefore intelligent, free and capable of merit. Sâmanacudŏm, as a hare, monkey or fish does he deserve in that state to pass into a more perfect body? But if an iron destiny has stopped and condemned those who have drank wine to be born dogs 500 times where is then their liberty of meriting a better lot? If they have acquired virtue in the first transmigrations why are they born dogs in the second and if they are obliged to accomplish their destiny by continuing to endure evil and always in the same degree, where then is their liberty?

To have a proper idea of the Metempscychosis as understood by the Cambojans, we must read the works of Néang thoréa, for this woman has treated this question at great length, and records the different transmigrations of Sâmonacudŏm.

ARTICLE 5th.

Of the Prohibition to Kill Animals.

Proceeding on the principle that the soul of man passes into the bodies of beasts, and vice versa, it is a natural conclusion that men and beasts are similar as regards the soul and that the organs constitute the only difference which exists between the one and the other. Men and beasts, then, are deemed to have the same nature, the same intellectual and moral faculties and the same destiny. It is on this doctrine that the prohibition to take the life of all beings which breathe, without exception, is founded. Two words will suffice to explain the doctrine of Sâmonacudŏm on this article 1st.—It is a crime to kill beasts. 2nd—It is not unlawful to feed on their flesh, if one has not himself killed them.

The common people regard animals as stupid beings and destitute of intelligence. This belief, inspired by common sense and the evidence before them, is contrary to the teachings of the sacred books and to the belief of the Bonzes.

Some pious Cambojans, guilty of having killed beasts, endeavour to reconcile it with the doctrine which they profess, by saying that their religion only forbids their being killed on holidays and not on other days. I do not know if some talapoins stretch a point in this and give this explanation in the extremity of the case, for they know as well as others that they must live. But this doctrine does not at all agree with the sacred text before me. The prohibition is general and allows of no exception or restriction. It is founded on the nature of the souls of animals, which are most certainly the same on common days as on holidays; and if this prohibition could admit of any exception it would certainly be in the killing of a dangerous and mischievous animal, especially those which wish to take our lives. But the text says, that even in that event, it is unlawful to kill beasts. Then comes the sanction of this law, according to which one ought to expect to be thrown into hell for having killed an ant or even a mischievous animal.

In spite, however, of this doctrine, as one must live, and as the stomach of a talapoin will not probably be content with a purely vegetable nourishment, they teach that one may lawfully eat the flesh of any kind of animal provided that one has not himself killed it. From this it may be seen that they are not very delicate or scrupulous in the matter of the co-operation. Although the bulk of the nation deny to beasts the faculty of speech yet this is not the case with talapoins. I have myself met some who contend that the animals speak, but that we cannot understand their language. This doctrine agrees very well with their sacred books, for the animals which are brought on the scene speak to each other and even converse with men.

Conclusion.

Whoever has sojourned in Camboja will have remarked certain points of doctrine difficult to be reconciled to each other and even with those mentioned in this notice. There is nothing wonderful in this. Some are taught in books, others are the popular beliefs. Moreover, it is not unusual to hear the Cambojans say amongst themselves such a pagoda does not teach the same as a neighbouring one; their books even do not always agree. Nothing is more natural than these differences in a religion rendered childish by the brains of ignorant and perverse men. The truth only is one and unchangeable like its author.

It is not with religion in Camboja as in Cochin-china. In Cochin-china it is null and resolves itself into nothing. A Cochin-chinese interrogated about his belief would be incapable of explaining it. Apart from some superstitious rites consecrated by the custom of the country, we may say that the Cochin-chinese has no religion. This is the reason why it is so easy to induce him to embrace the Catholic religion. In Camboja, on the contrary, there is a regularly constituted religion. It has its priests, its altars, its temples, its worship, its ceremonies, its holidays and its sacred books. It has, if I may so express myself, a body of teachers, and this body holds in its hands the monopoly of the instruction; these are the Bonzes or Talapoins. They are found everywhere, in the towns and in the villages, in the woods and in the fields. Wherever there is a group of four or five cabins collected together in the midst of a desert, there you will find a little pagoda and talapoins to perpetuate their errors; for the pagoda is always the school-house of the hamlet, where the young learn their letters and thus they imbibe the poison of untruth with the first elements of literature. It is thus that the religion of the country is so strongly rooted, and that strangers who come to combat it encounter so many obstacles. It is not only to the indolent, apathetic and unenergetic character of this people that we must impute the little progress which the Christian religion has hitherto made in Camboja, but it must be in part ascribed to the circumstances which I have enumerated. If we add to this, that the Cambojan is almost exclusively engrossed with the cares of his animal life, reflects little, reasons still less, and cannot forsake the religion of his fathers without breaking all the ties which bind him to his family, we will understand that his conversion becomes, I will not say an impossibility, for facts prove the contrary and the Christian religion is fitted for all the people of the earth, but at least a work which presents immense difficulties.

NOTICES OF PINANG.[*]

Extracts from a Dispatch to Court of Directors under date 31st July, 1806.

In obedience to the instructions contained in the 74th Para. of your orders of the 18th April 1805, our attention has been drawn to the necessity of building a Protestant Church on the Island. We delayed carrying into immediate effect your orders on this head, from the apprehension of its hereafter being found eligible to construct the intended Docks remote from George Town, which would of course draw the population to where the public works were established. This point however being expected to be decided on shortly after the arrival of the Civil Engineer, we should have deemed it our duty to have allotted funds sufficient for this purpose, had not the circumstances stated in the 1st and following Para. of our address in the Secret and Political Department, under date the 20th March, with the strict injunctions of the Government General therein alluded to, left it only in our power in forwarding your Hon'ble Court's orders to this effect, to urge the immediate necessity for the construction of this necessary building.

We regret that for the reasons assigned in the reply from the Government General, they cannot authorize the expense at present, but as we are assured that they will take the earliest opportunity of supplying the proper funds for this purpose, we anxiously look forward to being enabled to carry your orders on this head into effect, the necessity of which both in a moral and political view, we cannot too strongly point out, people of every other nation residing on the island having already commodious and appropriate places of worship.

* * * *

Although we had no reason to expect a general rise on the re-letting of the farms for the present year, as stated in our former address, we are happy in having it in our power to inform you that the following Farms were severally let on the 17th April last on the favorable terms undermentioned, viz:—

	Sp. Drs.	
Opium Farm, George Town for......	2,850 per month	
Do James Town..........	810 ,,	
		3,660
Gambling Farm, George Town......	2,220 per month	
Do James Town......	420 ,,	
		2,640
Arrack Farm, George Town.........	2,650 per month	
Do James Town..........	430 ,,	
		3,080

---

[*] Continued from p. 544.

Oil, Ghee and Hogs-lard Farm............	380
Pork Farm............................	550
Beetle Leaf Farm........................	1,010
Artap Farm............................	210
Salt Farm	475

The favorable terms to Government on which the Farms have been thus disposed of for the present year, affording an addition to our Revenues of Spanish dollars 54,420 per annum on the year preceding, notwithstanding the disadvantage of the late dry season and consequent failure of the May Pepper crop can only be attributed to the increased confidence in Government and improving population of the island. We have no reason, however, to expect that the arrack and salt Farms, will hereafter prove equally productive, the purchasers of these farms labouring under much disadvantage in consequence of the failure of the late pepper crop which prevents the Chinese and other cultivators indulging in their accustomed luxuries.

* * *

The farming the exclusive privilege of retailing Tobacco, under due regulations, appearing to us likely to prove an efficient source of revenue, without bearing hard on any class of our inhabitants, we have advertised it for sale accordingly, for the next year of account, and are confident it will meet our expectations in the amount.

We have no great reason to expect a general rise on the reletting of the Farms for the ensuing year, as the low price and little demand for Pepper, together with the probability of this very dry season destroying many of the vines, may press hard upon the Chinese, from whom are chiefly drawn the revenues under the heads of "Arrack, Gambling, Opium, and Tobacco Farms" and as the present high price of Quedah Rice leaves the inhabitants in general but small means of indulging in their accustomed luxuries.

The late Lieutenant Governor having forwarded to us from Calcutta a General Report on Prince of Wales Island, we have the honor to forward copy thereof as a number in our present packets.

This paper, although holding forth a flattering, cannot we fear be depended upon as containing an accurate, account of this settlement at the time of our assuming charge of its Government, and as we have found on examination that many of the estimates and calculations, as well as the principles on which they were founded, are erroneous, we have considered it our duty to enter our observations thereon on Record, in order to prevent the possibility of their leading to wrong conclusions, where the advantages of local information and a knowledge of contrary facts could not be easily obtained.

Mr Thomas Raffles, whom your Hon'ble Court was pleased to appoint our Deputy Secretary, having by studious application, united to great natural talent for the acquisition of knowledge in languages, notwithstanding every attention was at the same time bestowed to his other more immediate duties, attained for the time he has studied it, a wonderful proficiency in that of the Malays, we beg leave strongly to recommand his very praiseworthy exertions to the notice of your Hon'ble Court, by whom merit is sure to be rewarded; and we forward a copy of his letter to us on this subject, a number in the packet.

Local Press.

H. S. Pearson, Esquire,
Secretary to Government.

Sir,

I beg leave to acquaint you, for the information of the Hon'ble the Governor and Council, that pursuant to the permission granted by Government on the 30th ultimo, to establish a Printing Press on this Island, that the Press is now erected and I am ready to begin any Forms which Government may to pleased to have printed.

Regarding what may be inserted in the Gazette, I shall send a proof street to your office at 4 o'clock on the evening of every Friday, for the purpose of erasing any part which may be deemed improper to appear before the public.

I beg leave further to state for the information of the Hon'ble Board, that I have written to Calcutta, Madras, and Bombay for the purpose of ascertaining the several rates at which Government work is done in general, but believe it is contracted for by the month. The terms on which individuals will insert their Advertisements in the Gazette, are for every line where the number does not exceed fifty 25 pice, above that number 20 pice, but as few individuals have occasion to insert Advertisements of great length, I hope Government will not think it too much being charged that sum per line, for any orders they may chuse to promulgate through the channel of the Gazette.

I have the honor to be,
Sir,
Your most obedt. and most hum'ble servant,
(Signed) A. B. BONE,
For self and other proprietors of the Gazette.

Deted, 25th February, 1806.

Committee of Assessors.

Read the following Proceedings of a Special Committee of Assessors viz.—At a Special Committee of Assessors held on Monday, the 25th day of August, 1806—present W. E. Phillips, Esquire, Chairman, George Seton, James Scott, John Dunbar, and A. B. Bone, Esquires, European members, and Tiquah, Chee Amant, Gu Gee Pooke, Chee Eam, Cauder Moodeun, Jelaubdeen, and Noquedah Tomby Saib, native members.

Read a letter from the secretary to Government, dated 22nd August, addressed to the Chairman of the Committee of Assessors, stating that the board having had before them the proceedings of the Committee, on the subject of the abuses stated to exist in the Police Department, direct him to state, that as the Committee have not thought fit to call on Mr Kettner to appear in his defence, the board cannot come to any decision in the present stage, and have therefore referred an extract from the whole of the proceedings, with the exception of the last paragraph, to a committee to consist of the Judge and Magistrate as Chairman, and J. P. Hobson and Jas. Carnegy, Esquires, and requesting that the Committee will proceed to investigate the expressions stated in the last paragraph of the proceedings, and report to the board.

Resolved, that the Chairman be requested to write the following answer:—

To H. S. Pearson, Esquire,
Secretary to Government.

Sir,

I have had the honor of laying before the Committee of Assessors, your letter to me of the 22nd instant, and am requested in reply to say, that their proceedings of the 18th and 19th instant, originated entirely in consequence of the message from the hon'ble Governor communicated to them through me as their Chairman, and which message was desiring the Committee of Assessors to ascertain whither or not there did exist any grounds for the report in general circulation, that certain duties or fees were levied on the importation, or sale of gram in the markets of George Town.

That the committee proceeding on those grounds confined themselves merely to this enquiry, without conceiving that the nature of the communication authorized them to go into any *Judicial* Enquiry, to which the Committee conceive themselves totally incompetent.

3. The last paragraph of the proceedings of the Committee, originated from a voluntry declaration of the native members, that grounds existed for complaints of a more serious nature than those enquired into: Of which declaration the Committee took no further notice, than making it known to government, without conceiving that they as a body had thereby become *Accusers*.

4. The Committee further instruct me to say, that as the authorities under which they have heretofore acted, are confined to levying assessments, making and repairing the streets and superintending the market of George Town, the Committee did not think themselves authorized to go into any examination unconnected with either of these duties; but in compliance with the

recommendation of the Hon'ble the Governor and Council, the Committee have taken down and recorded in their proceedings of this date, such statements as have been voluntary made to them. At the same time they most respectfully submit to the Hon'ble the Governor and Council, the propriety of these or similar examinations being taken before the Committee of which the Judge and Magistrate is Chairman, who from being authorized to examine evidence on oath, are more competent thereto, than the present Committee of Assessors.

I have the honor to be, &c. &c. &c.,
(Signed) W. E. Phillips,
Chairman.

George Town, 25th Augdst, 1806.

The Committee respectfully submit to the Hon'ble the Governor and Council, the following statements, No 1 to 8, from persons brought forward by the native members, who state that they will verify the same upon oath before the Committee authorized to take such depositions:—

No 1.

Che Law, a Chinese fisherman, residing at Prya, states, that he purchased two slaves and paid for them 62 dollars, the slaves paper for whom he produces to the Committee. That one of the said slaves died and that one day about fifteen days after the appointment of the Police Magistrate, the other slave named Chin Hing absented himself from the said Chee Law's house without preparing his the said Che Law's victuals, on which, being hungry, he gave the said slave a few strokes with a rattan. That Cassim, the head Police Officer at Prya on this carried him and slave before the Police Magistrate, who adjudged him Che Law to be fined or flogged—that being unable to pay the fine, he received 2 dozen lashes with a rattan and the slave was given by directions of the Police Magistrate to the said Cassim, with whom he remains to this day, without the said Che Law receiving any compensation for the said slave.

The said Che Law further states the above named Ching Hing was at that time worth to him in consequence of having become acquainted with the business 60 dollars.

No. 2.

Pam, a Malay woman known to the Native Members of the Committee, and stated by them to be of unexceptionable character, declares that about three months ago, a daughter of hers of the name of Fatima was desirous of marrying a man of the name of Pream contrary to her Pam's wishes or consent. That her husband, whose name is Sultaun (and who is now gone to Queda), went in consequence to the Police Magistrate, and requested him to interfere and prevent the said marriage; that the Police Magistrate informed him if he would give him 20 dollars he would prevent the marriage between Pream and Fatima from taking place; that the said Pam in consequence carried 20 dollars to the Police office, and delivered the same to a Police peon of the name of Shaik American who carried the money upstairs, and as she believes paid the money to the Police Magistrate; as he brought down a written paper signed by the Police Magistrate addressed to the Malay Imam; the purport of which was to forbid him to marry the said Pream to her daughter Fatima and which paper she delivered to the said Imam, which Che Amaut an elder of the Malay Church (now present) knows to be a fact. And she further states that the said Police peon Shaik American told her if she disclosed this transaction, she would be severely punished, and notwithstanding the payment of the 20 dollars, the Police Magistrate subsequently sanctioned the marriage between the said Pream and Fatima.

No. 3.

Sookenillah, a Bengal milk-man, states that Merican one of the Police Jemautdar's informed him about 2 months ago, that the Police Magistrate wished to see him, that he went to the Police Magistrate, who told him he would give him employment in the police provided he could produce a good character from any European gentleman, on which the said Sookenillah applied to Colonel McAlister, who desired him to call again. On this he returned to his own house, and was informed that Merican Jemautdar had sent for him again, he went to the said Jemautdar who said to him—"Other men have offered 100 dollars, for employment under the police. If you will give that sum to be divided as is the custom, you may have a Tannahdany" he paid him 60 dollars, and promised him the balance by instalments (of making which payment he has three witnesses;) that he was directed to come next day, when he was asked by Mr Kettner, whether he had yet procured the written character required, that he replied yes, and produced one, but has neither received an appointment under the police, nor has he had his 60 dollars returned.

No. 4.

Ko, a Chinese, states he is a shopkeeper in George Town, states that about 17 days ago he sold a man a catty of sugar for 12 pice who paid for the same and carried it away; about 4 hours after the same man returned to the shop of the said Ko, accompanied by a Police peon, and under the pretence that the dodgeon (or weight) was false, carried him before the Magistrate when the same Dodgeon was tried, and found correct, but that the Police Magistrate ordered him to pay a fine of ten dollars, alleging as a reason therefore, that he had cheated him of some part of the weight of the said catty of sugar, though he offered to take his oath that he had given full weight, and though no evidence was produced to prove the contrary, and that he was obliged to pay the fine above stated.

No. 5.

Tho, a Chinaman, and who keeps a small shop and sells fish, states, that about 50 days ago having purchased three bunches of plantains for three coopangs, a Police peon (whose name he does not know, but with whose person he is acquainted) came and offered him two coopangs for the said three bunches of plantains, which he the said Tho refused. On which an altercation ensued, and the peon gave him a blow with a rattan and then went and accused the said Tho before the Police Magistrate with having beaten him the said peon, and in consequence two other peons were sent from the Police office and brought him before the Police Magistrate who was very angry with him for beating the said peon, and that the Police Magistrate ordered him to be confined in custody two nights and one day, and put him in the stocks; notwithstanding he informed the Police Magistrate that he had been beaten by and had not at all struck the said peon:—that at the expiration of the above period he was called before the Police Magistrate, who sentenced him to pay a fine of 20 dollars, which he was obliged to do without being able to obtain any investigation, although he stated that his father was a poor old man and totally dependent on him for subsistence and it was with the utmost difficulty that he could borrow the said 20 dollars.

No. 6.

George Seton, Esq. states, that a man servant of his named Juman was convicted before the Judge and Magistrate of theft, for which he was sentenced by the Hon'ble the Governor and Council on the 12th day of November 1805, to be once publicly whipped and to receive 50 lashes, and be confined in Goal for one year, and put to hard labor on the public works. And the said George Seton states that he has for some months past seen the said Juman attending the Police Magistrate as his syce, or horse-keeper, and that he is so at this instant.

No. 7.

Seack, a Chinese Apothecary, living in Market Street, George Town, declares, that he was one night about 4½ months since in bed with a woman called Esone, whom he cohabited with, that Pringue and Tuck entered the room and forcibly cut off his lock, then carried him before the Police Magistrate accusing him of committing a rape on the body of the said woman, who they stated had cut off his hair in the scuffle, but not being able to substantiate their accusation, Mr Kettner threatened to fine *them* 1,000 dollars each, and their hair to be cut off: that after a variety of forms being gone through, the whole ended in the said Apothecary's being fined 40 dollars (which is 20 dollars more than the Police Magistrate is authorized by the regulations to levy even if Seack was guilty of any crime) and his accusers were dismissed; which 40 dollars was paid by Che Wan's writer in the Court of the Police Magistrate.

Read and Approved,
(Signed) W. E. Phillips,
Chairman.

George Town, P. W. Island, Aug. 15th 1806.

On the proposition of the Honourable the Governor,

Agreed.

That a copy of the said proceedings be transmitted to this committee now sitting for the purpose of enquiring into abuses stated to exist in the Police department, with the request of the Governor and Council that they will bestow their best attention in investigating all the circumstances therein set forth.

* * * *

To Thomas Raffles, Esquire.
Acting Secretary to Government.

Sir—The committee of which we are the members for enquiring and reporting into abuses stated to exist in the Police department, report to you, for the information of the Honourable the Governor and Council, that at ½ past 3 o'clock of the day when we had investigated fully three charges against the Police Magistrate, Paul Kettner Esquire, in his presence, and were proceeding to investigate two remaining charges, the said Paul Kettner Esquire, requested that we would allow him to admit the truth of the facts charged in these two remaining charges, and that we would adjourn the Court till the pleasure of the Honourable the Governor and Council was made known, the Police Magistrate undertaking to tender his immediate resignation of his office to the Honourable the Governor and Council.

To this request we have ventured to accede; and the Hon'ble the Governor and Council we hope will approve of our conduct in so doing.

As soon as a fair copy of our proceedings, which are voluminous, can be made out by the clerk to the Judge and Magistrate, it shall be transmitted to you for the information of the Hon'ble the Governor and Council.

We are,
Sir,
Your humble servants,
(Signed) John Dickens.
James Carnegy.

Court House, George Town, P. W. Island, ½ past 4 o'clock P. M. 30th April, 1806.

* * * *

To the Honourable Philip Dundas.

Hon'ble Sir,

Permit me to vent the effusion of gratitude for your kind benevolence, and allow me to state that nothing is more distressing than the idea of having lost your good opinion; and could I flatter myself that in undergoing any further examination upon the charges, could obliterate in some degree, the unfavorable opinion you may have of me, surely I would suffer with the greatest pleasure, though death itself does not appear so painful to me than what I suffered on Saturday last, and I hope that your kindness will relieve me from any further proceedings; then were the people indulged they would probably being forward every individual case that has ever come before me, and Inchoon and Kankuang have convinced me what a gloss may be thrown upon any one circumstance if persons are so inclined. I am disposing of what little things I have and if it meets your approbation, I shall leave the island as soon as possible, as my staying here without employment would soon swallow up what little I have.

I am most respectfully,
Honourable Sir,
Your most humble, and for ever
grateful servant,
(Signed) P. KETTNER.

P. W. Island, 3rd September, 1806.

The Governor proposes that Mr Kettner be informed in reply that the Governor and Council cannot consent to his quitting the island under present circumstances, and refer him to their former instructions of the 1st instant, the proceedings of the committee therein alluded to, not having been yet received.

* * * *

At a Special Committee of Assessors held on Monday, the 8th day of September, 1806.

Present.

W. E. Phillips, Esquire Chairman.
George Seton, } Esquires { European Members.
John Dunbar, }
Nath Bacon, }
Che Wan, { Native Members.
Che Eam,
Gu Gupoolic,
Nacodah Tomby Saib,

The Chairman lays before the committee the following letter addressed to him by the Acting Secretary to Government.

To W. E. Phillips Esq. Chairman.

Sir—Having laid before the the Honourable the Governor and Council the proceedings of the Committee of Assessors of the 1st instant, I am directed to state in reply to the letter therein directed to be addressed to Government, that the Governor and Council have long been desirous of issuing due regulations established for the markets and deeming the opinion of the Committee of Assessors as likely very much to assist them in making such, they request the Committee's attention thereto and that they will when convenient lay before the Governor and Council, a draft of such regulations as may appear conducive to the desired end.

I have the honor to be,
Sir,
Your most obedient Servant,
THOMAS RAFFLES,
Acting Secretary to Government.

Fort Cornwallis, the 5th September, 1806.

Resolved.—That in compliance with the directions of the Honourable the Governor and Council, the Committee do proceed to submit such suggestions as appear to it conducive to the good order and better supply of the markets of George Town.

And as a ground to proceed on, this Committee respectfully submit as its opinion, that under the peculiar local circumstances attached to the supplies of the market, such as are *internal* and equal to the demand should have their prices regulated by a Committee nominated by Government, and that where the supply is *external* and those unavoidably variable, the price should not be fixed; but allowed to regulate itself according to the quality of the article and quantity in the market.

That proceeding on such ideas, the Committee is of opinion, that the following regulations will be necessary:

1st. That it be deemed the duty of the Police department to see that such articles as are restricted to be sold in this market, be brought there, and not disposed of elsewhere; the regulation however not to affect the supplies sent for from the Quedah shore, by European inhabitants for their own private consumption, and not for sale.

2nd. That in order to preserve due order in the markets, and compromise altercations between buyers and sellers, there be a person appointed as a Superintendent of the markets, with an assistant to preside there for that purpose, who may also be directed to keep a Register of the Imports as well as internal supplies daily, which will enable to the Committee before named, to fix the prices of the latter at stated periods; but it is the opinion of this Committee that such Superintendent should not be invested with any other powers, and that in all cases exceeding his limited authority, an immediate reference be made through the Superintendent to the Police Magistrate.

3rd. That the Superintendent be furnished with an adequate number of scales, weights and measures, for the purpose of the market people, which are to be stamped, *and lent in the market gratis,* and that none other are to be used.

And further that the Superintendent and his assistant be placed under the control of the Committee alluded to in the foregoing article.

4th. The Superintendent and his Assistant to be prohibited from buying for the purpose of selling either directly or indirectly, any of the articles restricted to be sold in the market; and that security be demanded for their good conduct.

5th. That no person excepting the bazar guard wearing arms or *any* badge of authority, such as European soldiers, sepoys, or peons, be permitted to enter the market with such badge; it having been found from experience that such marks of distinction have enabled the ill-disposed to practice acts of violence and oppression upon the retailers in the bazar.

6th. That with the exception of fish and vegetables, the sale of all articles should commence at 7 o'clock in the morning, and close at 6 at night, that the markets be open and shut by the Superintendent by beat of gong, and that during these hours, the Superintendent or his Assistant be constantly present.

7th. That hours for the sale of fish and vegetables should not be limited, but permitted at all times.

That the Committee is of opinion, that it will be found difficult to procure a native competent to fulfil the duties required from the proposed Superintendent of the markets, and therefore respectfully submit to the consideration of the Hon'ble the Governor and Council, the expediency of intrusting the management of that department to some European who may understand the Eastern languages.

Read and approved,
(Signed) W. E. Phillips,
Chairman.

The Honourable the Governor proposes that the Chairman of the Committee of Assessors be informed, that the Governor and Council approve of their trying the experiment, and authorize the Committee to carry the same into execution, provided they can find means to defray the expence of the Superintendent, scales, weights &c. &c. &c. so as not to become charge to Government.

That the Chairman be however informed, at the same time, that the Committee are not to understand from this, that the Board approved either of the General Principle of the Plan, viz. that of a market without control, which they consider as not applicable to this place; or of the detailed regulations which the Board are convinced will be found very difficult, if not impracticable to be carried into execution.

That the Governor and Council relying much on the local experience of the Committee, they are willing, that the plan on the faith of their recommendation should be put to trial, which they hope the Committee and the inhabitants in general, will consider as a desire to accommodate themselves to their wishes in every case where the same may be practicable.

* * * *

19th September, 1806.

Read the following proceedings of a Special Committee of Assessors, viz.—At a Special Meeting of the Committee of Assessors, held at George Town, on Monday, the 15th day of September, 1806.

Present

W. E. Phillips, Esquire. Chairman.
John Dunbar,
John Scott and Esquires European Members.
George Seton.
Che Wan,
Che Eam,
Che Amant,
Gu Gupoolic, Native Members.
Che Amant,
Gelaubdeen and
Cauder Meydin.

The Chairman lays before the Committee the following letter, addressed to him by the Acting Secretary to Government:—

To W. E. Phillips, Esquire,

Chairman of the Committee of Assessors.

Sir,—I have to acknowledge to receipt of the proceedings of a Special Committee of Assessors, held on the 8th instant, submitting their opinion on the mode best adapted for the general supply of the markets, and suggesting certain regulations necessary in consequence.

2nd. That the Honourable the Governor and Council having taken the same into consideration; I have their directions to acquaint you, that they approve of the mode recommended by the Committee being adopted, and they authorize the Committee of Assessors to try the experiment, provided they can find means to defray the expences of the Superintendent, scales, weights &c. &c., so as not to become a charge to Government.

3rd. I am however directed to observe, that the Committee are not from this to understand, that the Governor and Council approve either of the general principle of the plan, viz.—that of a market without control, or of the detailed regulations, which the Board are convinced will be found very difficult, if not impracticable, to be carried into execution.

Relying on the local experience of the Committee, they are willing that the plan, on the faith of their recommendation, should be put to the trial, which they hope the Committee and the inhabitants in general will consider as a proof of their desire to accommodate themselves to their wishes, in every case where the same may be practicable.

I am,
Sir,
Your most obedient servant,
(Signed) THOMAS RAFFLES,
Acting Secretary to Government.

Fort Cornwallis, the 12th September, 1806.

The Committee having taken the within letter into consideration, beg leave with deference to observe, that the suggestions contained in their proceedings of the 8th instant, were merely intended to convey to the Honourable the Governor and Council the general sense of this Committee, relative to the internal management of the markets of George Town, as a basis on which (if approved) Regulations might be formed by the Honourable the Governor and Council, but that as it appears by the letter now before the Committee, that the Honourable the Governor and Council do not approve of the general principle of the Plan or of the detailed Regulations, but are willing to put them to the trial as an experiment, provided the Committee can find means to defray expence, so as not to become a charge to Government, the Committee beg leave to submit to the consideration of the Honourable Board an advertisement by the Chairman of a former Committee of Assessors, dated the 31st January, 1803.

" Notice is hereby given, that the Committee of Assessors for " George Town having completed a commodious bazar for the " sale of fowls and other poultry; all persons whatever are here- " by prohibited from selling fowls, or other kind of poultry any- " where within George Town, but in that bazar, and any person " convicted before the Judge and Magistrate of selling fowls or " other kind of poultry, contrary to this Regulation, will be fined " for every fowl, one copong; for every capon, duck or goose, two " copongs, for every offence,—one-half of the fine to go to the " informer, and the other half to the fund for repairing the streets " of the Town. This regulation to have effect from the 15th of " February next.

" By permission of the Acting Lieutenant-Governor.

(Signed) GEO. CAUNTER,
Chairman.

"George Town, Prince of Wales Island, 31st January, 1803."

Subsequent to the above Advertisement the late Lieutenant-Governor, Mr Farquhar, issued a Proclamation rescinding the same, and permitting the sale of poultry &c. &c. where and when the vendor thought proper, but the inconveniences resulting from the Proclamation, led to the proceedings of a Committee of Assessors held on the 5th November 1804, which this Committee also respectfully submit to the consideration of government:

Agreed.

" That on account of various representations having been made " to the Committee of the difficulty of procuring poultry, which " appears to be in consequence of the Lieutenant-Governor's Pro- " clamation rescinding the Regulation of the Committee of the 31st " January, 1803, and particularly from the representation of Mr " McIntyre, Clerk of the Market, who states, that the people " boarding the prows and taking poultry at their own price out of " them when they ought to be brought to the public markets, and " in consequence create many disturbances, and deters the natives " from supplying the market. In order therefore to obviate these " inconveniences, the Committee submit to the consideration of " the Lieutenant-Governor, the following amendment viz:—

" That in lieu of the Assistants and Peons now allowed the " Clerk of the Market there be appointed a Panglima Puckan, to " reside in the market, from 8 till 12 in the morning, and from 2 " till 6 in the evening, who shall be a third man to see justice done " between the buyer and the seller, that some respectable Malay " be chosen for this office with a salary of 25 dollars per month, " and that any additional expence be paid by the Committee, and " in order to give confidence to the Nacodah of the Prows, who " supplies the market, that the following be the fixed prices of " poultry brought to market viz:—

" Ducks, four for a dollar.
" Large Fowls, six for a dollar.
" Small Fowls, twelve for a dollar.
" Capons, four for a dollar.

" And that in case of any dispute the Pungalama Puckan be " the Umpire; that the Regulations of the Committee of the 31st " January, 1803, be republished in as far as that all poultry be " sold in the public market; and that the penalty on deviation " therefore be doubled and that the Acting Lieutenant-Governor " will take measures that prows bringing poultry to market, are " not boarded by any person with an intent to forestall, or impede " a free import."

In the letter from the Acting Secretary to Government to the Chairman of the Committee, dated the 5th instant, it is stated, that " the Honourable the Governor and Council have long been " desirous of seeing due regulations established for the markets, " and desiring the opinion of the Committee of Assessors, as " likely very much to assist them in making such, they request " the Committee's attention thereto and that they will when con- " venient lay before the Governor and Council, a draft of such " regulations."

In compliance with the directions contained in the letter above quoted, the Committee have laid the foregoing advertisement and proceedings of the former Committee, before the Honourable Board, as the best materials it can furnish for the purpose required, at the same time the Committee respectfully submit that the present state of its funds is such as to render the Committee inadequate to defray any other expences than keeping the streets in repair, and collecting the Assessment, and that Mr Brown has acted as Clerk to the Committee for the last twelve months without receiving any salary or compensation whatever for his trouble.

Mr Dunbar having stated to the Committee that Tomby Sahib has connived at the nefarious transactions of the late Police Magistrate, as appeared in his examination as a member of this Committee, when called before the Committee of which the Judge and Magistrate was president,—Tomby Sahib having thereby acted unworthy of a member of this Committee, and Mr Dunbar's statement being corroborated by a majority of the Committee; the Honourable the Governor and Council are respectfully requested to be pleased to direct a meeting to be called of the Landholders of George Town, for the purpose of expelling Tomby Sahib from his seat as a member of this Committee and for the further purpose of electing another representative in his room.

Read and Approved,
(Signed) W. E. Phillips,
Chairman.

George Town, P. W. Island, September 15th, 1806.

Complaint by the Judge and Magistrate (Mr Dickens) against a Mr Douglas.

To Thomas Raffles, Esquire.
Acting Secretary to Government.

Sir, – It is with real concern that I am again obliged to request that your will represent to the Hon'ble the Governor and Council, that this morning Mr Douglas, an inhabitant of this island, was guilty of a wanton outrage on me, in my public character, as *Judge* and *Magistrate*, for the *judicial* conduct which in obedience to the orders of the Honourable Board, it has fallen to be my duty to observe towards him in the various suits lately preferred by and against him in the Court of Justice over which I preside.

2nd. On referring to your letter of the 26th ultimo, wherein the Honourable the Governor and Council &c. express a hope, that by prohibiting Mr Fenwick's return to this island, they have precluded the possibility of *a recurrence here of such conduct in future*, I feel myself justified in expecting the most exemplary notice will be taken by the Honourable the Governor and Council of the conduct of Mr Douglas, which I shall by and bye particularize, because, in fact, it will appear much more heinous and destructive of the pure administration of justice, than even that of Mr Fenwick.

3rd. Mr Douglas heretofore took the liberty of addressing a letter to me in my official capacity, on the cover of which I wrote that all official applications should be made in person, or by attorney constituted in writing, and affixed to this writing the seal of the Court. Notwithstanding this notice, the day before yesterday Mr Douglas directed a letter to me, omitting on the direction my official character, which letter enclosed an extract of a letter from Mr Acting Secretary Raffles to him, conveying a reprimand, and called on me to state, why such a severe reprimand had been given him by the Honourable the Governor and Council. I did not reply to this letter, but yesterday in open Court, where Mr Douglas appeared as a defendant to a suit instituted against him I addressed myself to him, and observed, that the proceedings on which the Honourable Board *had exercised their judgment* were those signed by himself, all which he had heard read. And that I knew not by what right he presumed to call on me to explain why the Honourable Board reprimanded him, and that I was surprized he should take the liberty of writing to me a letter on such a subject, after I had stated to him that I did not receive any letter on official business. And that it was extremely improper in him to address a letter directed to me as a private individual on a public judicial subject.

4th. I also stated to Mr Douglas, that he must be aware that he had sworn before me that he believed Vantray died without a will, and that this affidavit *was on record*, when it afterwards appeared that at the time he, Douglas, made the affidavit he had a will of Vantray's in his possession, and which he afterwards produced, on which will there was endorsed in the English language and character two endorsements—one in pencil "Varsey's Will," the other in ink, "supposed Will of Varsey Mahomed."

5th. Mr Douglas thought proper to declare in open Court that he did not come there to be reprimanded by me. Upon which I observed to him, that if he wished it I would make a minute on the proceedings of these circumstances and submit my conduct therein to the judgment of the Honourable the Governor and Council, as he was not subject to my *ordinary* jurisdiction. Mr Douglas not appearing to wish that I should enter should a minute, it did not appear on the proceedings of yesterday's Court.

6th. A little before 7 o'clock A. M., of this day, near to the new Convict lines, I met Mr Douglas on horse-back, being myself in a carriage. Mr Douglas addressed himself to me, requiring an explanation and satisfaction for my conduct to him in Court. I told him I was surprized at his daring to interrogate me in that manner and that I would not permit him, or any man, to expect that I would explain to him my official conduct as Judge, upon which he threatened me, saying "he would have ample satisfaction" and swearing "he would have my blood." Human nature is frail, and I confess that I was wrong in my reply. I told him, "he was a scoundrel" and that he had now an opportunity, and that if he had the spirit to do it—"why did he not now take his revenge?" His answer was, "he had no pistols, but if he had he would."

7th. Having narrated these facts, and apologized for the momentary irritation, occasioned by the wanton attack made on me by such a person, I can only repeat, that this event furnishes another instance of the injurious effects resulting from the Honourable the Governor and Council compelling me to examine into complaints against British subjects, whose respect and obedience to my judicial opinion I not only cannot command, but who think themselves authorized to resent as a private personal injury, the judicial duties I perform in obedience to the injunctions of the Honourable the Governor and Council.

I have the honor to be,
Sir,
Your very humble servant,
(Signed) JOHN DICKENS,
George Town, 21st December 1806, 9 o'clock A. M

The Superintendent Engineer on the Defences of the Island.

Sir,—In obedience to the orders of the Honourable the Governor and Council, contained in your letter to me of the 9th instant, I have the honor to forward a rough sketch of Farquhar Street, and all the lots of ground contiguous.

The piece of Ground which remains to the Honourable Company, and on which part of the old hospital now stands, is bounded by a deep red line, and two lots offered for sale by Messrs Brown and Clarke, are bounded by a fainter red line. The whole united forms a most valuable piece of ground, and for many important reasons, I take the liberty of recommending that Messrs Brown and Clarke's proposals be accepted, and the purchase made without delay.

It is much to be regretted that any of the ground between Farquhar Street and the Sea, was ever sold to individuals. It was invaluable to Government for many purposes. In the first place for public buildings of all descriptions. But as connected with plans which I hope soon to submit to the Honourable Board, for the protection of this almost defenceless Town and Point, it was still more valuable. And I recommend the Government lose no opportunity of repurchasing any and every lot of that ground offered for sale.

Although owing to the numerous avocations that have occupied my time, I have not been able to lay before government any reports relative to the very important points referred to my consideration, in their Secretary's letter of the 3rd July, &c. &c. &c. yet the subject I have never for a moment lost sight of and I am giving it my most serious consideration.

I have twice visited Pulo Jerajah. I have examined the Quedah shore, and have proceeded for many miles up the Praya river, sounding &c. as I went along and when duties of less consideration afford me the smallest leisure, and the season is more favorable, I shall make more extensive and more minute researches.

But I will admit for a moment that a more desirable site may be discovered for a capital, still the point of land on which George Town stands will always be the site of the second Town on this island, and it will continue to be a most formidable rival to any capital that may be established. The numerous reasons why it should prove so, must be so obvious to every member of the Honourable Board, that I think it unnecessary to dwell upon them in this letter.

I am accordingly preparing a scheme of defence for this very important port, and as I consider the works on the Point called Fort Cornwallis, unworthy the name of a Fort, and incapable of any defence, *unassisted* by the Ships of His Majesty's "Fleet" which may accidentally be here, I would ere this have dedicated less of my time to ordinary duties, and come before government with plans for a respectable and permanent fortification. But at this season of the year, even if approved plans were determined upon, they could not be carried into execution, and I have every reason to believe, that I shall have sufficient leisure to submit plans to government that may be begun upon, the moment the dry season commences.

In regard to Fort Cornwallis I cannot conscientiously recommend any money being laid out on it, either for a magazine or in the way of improving the works, but I shall have the honor, very shortly, of laying before the Honourable the Governor and Council a letter on that subject.

I now beg the indulgence of the Honourable Board, to return to the original subject of this letter. The ground offered for sale has advantages in a lesser point of view, that are worthy of consideration.

The old hospital has been thought of for a temporary Church, but it stands so awkwardly with its corner intruding upon Farquhar Street, that it was only temporary convenience that could make the scheme advisable, I therefore beg leave to suggest the plan, marked in the sketch with black lead pencil lines, of a second branch Farquhar Street, or a double street with a Church between. The Church so placed would almost appear the result of taste or fancy, and not that of a temporary expedient, also this road would be a great accommodation to the inhabitants of Farquhar street and do away every plea of complaint of their not having the street promised there.

I have the honor to be &c. &c.
(Signed) THOS. ROBERTSON Captain,
Superintendent Engineer and Surveyor.

P. W. Island, 23rd September, 1807.

A TRIP TO MOUNT OPHIR.*

A couple of companions and the writer agreed to make the ascent of Ophir, for the purpose of obtaining some of the rare and valuable specimens of Botany it produces. After arranging with two of the Punghulus to meet us at Ayer Panas, with a number of coolies, and having sent our baggage on in carts, with the paper and boards necessary for collecting and preserving the specimens, we started from Malacca, on Wednesday, the 8th inst. for Ayer Panas, where after an agreeable drive of about 15 or 16 miles over an undulating country, we arrived at an early hour and took up our quarters in the Government Bungalow; a very comfortable habitation for the jungle, where we enjoyed our first breakfast. The spot on which the house is built is prettily situated on a rising ground, well cleared, upon which the eye rests with peculiar satisfaction after having had nothing to look upon for an hour previously but the tame monotony of the jungle. We walked about this pleasing little spot for some time, examining the Botany of the place and visiting the Hot Wells, about 150 yards from the Bungalow.—The spring is rather curiously placed, in the middle of a paddy field, about six feet four inches square, with a clear stream of water running within 2 feet of its edge. The temperature was 122° F.—not within 10 degrees of the Hot Wells of Sebang. From the bubbles of air constantly escaping, I should suppose that it contained carbonic gas and the sulphureous smell indicates something more than a mere thermal spring.—With all due deference to the analysis made in Calcutta, I am inclined to think that the Hot Wells of Sebang also contain carbonic gas and sulphur, for the same reasons; and that they further contain a portion of iron, I am convinced by the red *feruginous matter observed floating* on the surface, and which professor Ehrenberg of Berlin, has proved to be composed of the outer sheaths of minute infusinal animals, which appear to possess the power of secreting oxide of iron and silver, and only flourish in chalybeate waters. Having finished our walk, we mustered our coolies, 52 in number, whom we had agreed for at the rate of 7 fanams 2 pice each man per diem, and despatched them with their respective loads to Rheim, about 7 miles further, where we had arranged to dine and sleep. It is a very necessary precaution for travellers to take, that of distributing equally their baggage amongst the coolies, they being exceedingly lazy and unaccommodating to each other; and if not looked well after, will walk off with scarcely anything on their backs, leaving your traps to be carried as best they may. The road from Ayer Panas to Rheim may be travelled in a Buggy by those inclined to patronize bone-setters and coach makers; but for those not possessing such singular predilections we would recommend the equestrian mode of travelling.—At Rheim there is a small stockade and a Havildar's guard: very little cultivation, which consists of only a few paddy fields, but the natives informed me that there are vast numbers of fruit trees; the supply of fruit during the season always abundant, and that last year the crop was so prolific, and consequently so cheap, that many persons would not take the trouble of pulling their fruit. In the evening we took a stroll into the adjoining woods, where we collected several fine species of ferns and other plants, and, had time permitted, I think we might have reaped a considerable harvest at this spot.

---

* From the Singapore Free Press 1840.

On the following morning, after a very satisfactory night's rest in an open shed, we started the coolies with their respective loads, and followed ourselves on ponies, for upon leaving Rheim all semblance of a carriage road ceases. We soon entered the primeval forest, though which there is a road to Chaban. With the exception of an occasional monarch of the woods measuring his length across the path, which sometimes proved over much for the agility of our little ponies, and occasioned some loss of time in dismounting and making a detour through the jungle—I cannot say that I much admired the ride; but my companions were of different sentiments. To me the death-like silence that prevailed, for not even a monkey was to be seen or heard, nor the chirp of a single bird, the gloom of the dark forest, and a chilliness that penetrated to the bone, were not productive of very agreeable sensations. Out of justice to the forest, I must say that I never beheld finer timber in my life, many of the trees shot up more than eighty feet without a branch, straight as poplars, and carrying the girth up with scarcely perceptible diminution. Along this road we were not very fortunate in our Botanical researches, the month of January being a bad flowering month, and consequently an unproductive season for a botanical excursion through the Malacca jungle—The chief plants we met with were a few ferns and a small yellow flowering orchideous plant, which was abundant along the side of the path. The distance from Rheim to Chaban is about 7 or 8 miles, and took I think 3 hours in travelling; in consequence of the frequent halts to examine and collect plants. At Chaban there are a few Malay houses where we procured some ducks and fowls, and where we halted to rest the people; and in the mean time under the pleasing shade of coconuts and other palm trees, we discussed the merits of a capital curry, which precaution I would recommend to the notice of all future travellers, to prepare them for a long and tedious journey over one of the vilest roads it has ever been my bad fortune to travel, viz.– the road from Chaban to the foot of the Mountain. The Punghulu of Chaban resides two or three miles from the place where we stopt at, and here our men laid down their burdens, and one and all declared, although it was only 12 o'clock, that it was out of their power to proceed further, as they had no rice, and there was not another habitation between that and the mountain, which was distant a full day's journey. Had we listened to this complaint our future plans would in all probability have entirely miscarried, and we might altogether have failed in the accomplishment of our object; so we told them determinedly that if they did not take up their loads and proceed forthwith, they should have their labour for their pains, as not a single pice should they receive. This "*argumentum ad crumenum*" had the desired effect, for after a little further demur, they shouldered their burdens and off again we all set. The distance from the Punghulu's house to the foot of the mountain may be about 11 miles, and the road is one of the worst I ever went over, being cut up in various places, so that we had frequently to alight, as also to ride knee deep in mud through swamps. On again entering the forest, the path was narrow, uneven, and slippery from late rain; and so blocked up in various places by logs of timber lying across it, that it was matter of astonishment to observe how our sure footed little nags kept their equilibrium, and how speedily they acquired the knack of scrambling over all impediments. On our way we stopt at Assahan, the utmost limits of the Company's territory, where on a small hill we refreshed ourselves with drinking coconut water, there being several very fine trees on the hill, without an habitation of any sort near them—a most unusual circumstance in a Malayan country.—The view of the different ridges of the Mountain from this spot is pleasing and picturesque but we soon re-entered the dense jungle where the ride was far from interesting, and as the day began to decline the idea of being benighted in such a dense unhealthy spot was anything but pleasant. The men seemed to be of a somewhat similar opinion, for notwithstanding their previous plea of inability, they pushed on at a famous rate, and we gained the Gold Mines at the foot of the Mountain, a little after 5 P. M. Here instead of finding an industrious colony of Chinese, as formerly, all was desolation—One very good house containing rude furniture remained, of which we forthwith took undisputed possession, congratulating ourselves not a little that this welcome habitation had escaped the fury of the Malays, in their indiscriminate destruction of life and property. Before our departure from Malacca we had received various and contradictory reports of this occurrence; some assuring us that the Chinese had returned to the Mines, others that all who could escape had fled, and that the rest had been murdered. The total abandonment in which we found the place but too truly confirmed the latter report; and it is difficult to assign any reason for this bloodthirsty massacre beyond the fiend-like propensity of destructiveness, inherent in the Malayan character; for the act must have been directly in opposition to their own interests,, the Malays not being able to work the mines themselves, and at all times they had taken care to exact the lion's share from these unfortunate sons of Han, whom the "*auri sacra fames*" had deluded to their destruction. The number of Chinese formerly at work was about

60, the places from whence the earth was taken, in which the gold is found, are holes dug only a few feet deep, situated in a small basin at the foot of the hills. The apparatus for emptying the pits of water, and many other tokens that the Chinese had been denizens of this wild waste still remained; such as industrious efforts at gardening in a few kalavances and other vegetables, still maintaining a feeble existence, despite the encroaching and all prevailing lalang grass.—Our ponies quickly discovered these delicacies and regaled themselves upon them with visible satisfaction.

At morning dawn we arose to make the necessary preparations for our ascent of the mountain; but what with the Malays boiling their rice and tying their bundles to be carried on their backs, we did not start until 7 o'clock. A guide whom we picked up at Chaban, and who professed a thorough knowledge of the road, had preceded us in order to refresh his memory of the localities, of which we soon found to our disappointment, he knew but little. We rode for a short distance through dense lalang, and hoped from what we had previously heard, that we should have been able to take our ponies half way up the hill, but we soon found that this was altogether impracticable, and were compelled to send them back —but not before the one on which I rode gave me a gentle hint as to the necessity of doing so, by falling down and rolling over me. The fields of lalang through which we passed were intersected in every direction by elephant's tracks, their dung and fresh footsteps were abundant—one footmark which I measured was 14½ inches in diameter, and in one place we came to a spot where a gentleman had apparently slept the night before—I was not sorry that he had proved himself an early riser, for notwithstanding my double barrel, I felt no inclination to be one of those who would disturb his slumbers.

Upon quitting the lalang, we crossed a small mountain stream, ascending it for a short distance, and struck into a wood upon our right. Here the guide completely lost himself, and we had the agreeable satisfaction, after wandering about for upwards of 3 hours, to find ourselves in the same position we had started from; having walked round a hill instead of ascending one; during which period our thoughts were agreeably abstracted by pulling off the wood leeches which stuck to us in every direction! Whilst indulging in sundry benedictions upon our guide, we heard one of the Malays call out *ular-ular*, (a snake, a snake) adding that it was as large as a betelnut tree. Under our forlorn circumstances any little incident was acceptable, and, double-barrel in hand, I ran to the spot and beheld a huge monster of a boa lying coiled upon the ground at a short distance from me. Upon receiving a charge of shot in his head, he slowly uncoiled himself and attempted to make off, but I stopped his progress with a ball which passed through his back, and my companions coming up despatched him with clubs.

On measuring, we found him 19 feet 1 inch in length, and as thick round the body as a stout man's thigh; one of my companions, an old traveller, was very desirous of having a joint cut off for his dinner, declaring it to be most excellent food—but upon mentioning the wish to the Malays, they appeared to think I was quizzing. The eating of a snake was evidently not allied in their minds to any civilized act, so I thought it better as we were not in absolute want, to yield to their prejudices and deprive my friend of his epicurean repast. After this exploit our intelligent guide came up and informed me that he could not find the road, a piece of information I duly thanked him for—but nothing daunted, I set off over a hill to seek the road myself, which after about half an hour's seeking, I had the good fortune to fall in with, and soon perceived that had we hit upon the right path, we could easily have ridden up nearly half way—it is a well beaten tract *when once found*, and of easy ascent for a considerable distance. The Malays called the hill Bukit Panjang[*] and we certainly found it long enough, for it well tired our muscles and sinews. We had to ascend and descend several hills before we arrived at a place called "Padang Batu"[†] which is calculated as half way.—Here the trees begin to assume a stunted appearance, and it was immediately above this spot we discovered what we were most eagerly in search of, the great Ophir Fern. We found it growing in abundance and when we looked upon this choice botanical desideratum all our toil and trouble vanished. There being only one specimen of it in England, indeed I believe only one in all Europe, we endeavoured to make up the deficiency by collecting 100 specimens, all of which, along with many others, we have had the good fortune to bring back in a high state of preservation. This Fern grows up a single stem to the height, in some places, of seven feet, throwing out its fronds, in a fine shape from the end of the stem—it has a most beautiful appearance. We were compelled to select small specimens for the convenience of carriage, but we saw some plants with fronds nearly 2 feet in length—I think we procured about 20 new species of ferns, besides many other plants, amongst them one of the loveliest orchideous plants I ever beheld. The flower of this is however too delicate to preserve any of its splendid appearance in the Herbarium, but as we secured several of the roots, we hope that it may yet adorn some of the collections in our native country. The gentleman who takes it home, is well known for his taste and experience, and it could not be confided to more zealous and careful lands. Leaving the task of collecting for our return, we pushed on and arrived at the top of the mountain, about 4 o'clock P. M. The weather being tolerably clear towards the Malacca side, we enjoyed a splendid prospect of the country in that direction, with the sea and islands, all lying like

[*] Long Hill. [†] Stone field.

a beautiful Panorama beneath our feet. On the opposite side our view was impeded by a thick haze, and we could only observe the country contiguous, which exhibited no signs of cultivation and had the usual appearance of one unvarying forest scene. On the top of the mountain there stands, at an angle of nearly 45, an immense block of granite, about 35 feet in height, under which we took shelter for the night. The rain and condensed mist from above filters through the soil under this rock, filling a small basin with pure and delicious water, which proved more than sufficient for our whole party, 70 in number.—The air felt much colder than was indicated by the Thermometrical variation, which only fell to 64 of Fahrenheit, and the natives felt it cruelly, becoming perfectly useless. We could scarcely persuade them to gather a few sticks for the purpose of making a fire for our culinary operations. Having brought up a number of kadjangs with us, we formed what we conceived a comfortable habitation for the night against the granite rock, and distributed the remaining kadjangs amongst the people; who huddled themselves underneath, in groups of ten or a dozen, sitting close together to keep themselves warm, and dispensing with the luxury of lying down. Myself and companions having had quite sufficient exercise to give a zest for even spartan broth, enjoyed ourselves much to our satisfaction, declaring every thing to be the best of its kind. We needed no saltpetre for our wine, and amongst ourselves settled the fact that it is worth going up the mountain were it only to enjoy a glass of good liquor. Nevertheless we dealt temperately enough with the bottle; and after a cigar soon found ourselves stretched in pleasing obliviousness to all worldly cares under the granite rock.—Our dormitory however did not prove quite so confortable as our anticipations led us to hope; for the wind blew strongly, accompanied with a driving mist which condensing on the rock rolled down upon us towards morning in a constant drop and thoroughly wet ourselves and our bedding; and were I to ascend the mountain again I doubt whether I should select the same locality—although during the northerly monsoon it certainly shields you from the force of the wind. When we arose in the morning, all was shrouded in thick mist, the men and ourselves dripping wet and miserably cold—the Malays were quite paralyzed, and I believe we all felt quite as anxious to take our departure as we had previously been desirous of making the ascent. Before leaving, we again paid a visit to the summit, from whence we brought away several species of plants. On the very topmost towering height I found one of the largest Nepenthus or Monkey-cups I have ever seen—whilst fresh, it contained two breakfast cups brimming full of water. These plants abound on the mountain; I think we saw 5 or 6 species of them—and I much regret not having secured some of each kind.

Having now taken my readers, if any have had the perseverance to follow me, to the top of the mountain, I shall take it for granted that they are quite sufficiently fatigued to be excused accompanying us in the descent. We returned from the top of the mountain to Malacca in 3 days, halting at the same places and making the same stages. The writer caught a slight fever, which yield quickly to one or two heavier doses; many of the men who accompanied us have been also attacked, and some, I am sorry to say, are not yet recovered, evidently shewing that we were within some malarious influence. The whole distance from Malacca to the foot of the mountain, may be about 40 miles—from the gold mines to the top about seven more. We made the trip rather early in the season, the month of February being the best time of the year to make the ascent, and May and June about the worst. In conclusion, I may observe, that on our return, we marked with crosses many trees at the bottom of the hill, where we lost our way, which, if discovered, will point out the road to any future traveller, as they are marked up to the spot where the path becomes plain and evident.

27th January, 1840.

THE COMMENCEMENT OF ABDULLAH'S SCHOOLING.[*]

After being engaged in this way[†] for some time, I became accustomed to hold the pen, and was able to trace the characters a little, though imperfectly, till one day my grand-mother,[‡] seeing I had nearly got the shape of the letters, set me a copy, on a small board, and desired me to study it. I attended to my lesson only at such times as I pleased, and at other times played. In this way I got on till I was 7 years of age, without ever having been punished, or scolded, and in consequence I learned nothing. At this time my father arrived from Siak and enquired about me from his mother, whom he called "Ache" in Kling language, that is in Malay "Kakah" (elder sister) because she was only 13 years of age when he was born, and she looked more like his sister than his mother. He said "sister, how is Abdullah getting on in his learning?" My grand-mother replied, "don't you trouble yourself about his learning just now, as he is too weakly to bear any beating or unkindness." A few days after this my father removed to the neighbourhood of Campong Pali, and every day I went to learn at the school, and at night was taught by my father. How often was I beaten, and how many learning boards were broken by my master on my head, and how many rattans were used up on my body. How many times didmy mother cry over me on account of my numberless beatings. My fingers would be swollen up with beatings for mistakes in writing. With such difficulties is the acquisition of knowledge attended!

At that time my heart was full of hatred, and wrath, and malice against my instructors. I even prayed that God would cause them to die, so that I might be free to follow my inclination for play. I was very fond of flying kites, and when caught would be beaten, and with the kite hung round my neck, be obliged to go on with my lessons; but when my instructor was indisposed, that was a grand source of joy to me, as I took a holiday and ran out to play. I was also extremely glad if my instructor, or any other person, employed me to do any thing, no matter what, provided it gave me an excuse to be absent from my lessons. If there was the slightest thing wrong with my body I instantly became sick, and thus, also, escaped lessons. I would rather see the face of a tiger than my instructor any day. It is the custom if a garden is a good one to cultivate it, but if it has no fence, of course wild beasts will enter and destroy.

I continued learning, and with the assistance of God, became able to write. I was not like the other children, whose parents were satisfied if they could simply read the Koran, and indeed if one does not learn to write when young, how can he afterwards write correctly when old? Man in this respect is like a tree, which, if taken young, can be trained into shape, as its parts are soft and pliable, but when the tree is old the wood becomes dry, and if attempted to be bent, will break. I continued to be instructed by my father and grand-mother, and two uncles, one named Ismail Lebbye, and the other Mahomed Latif. These two were my father's brothers, by the same mother. To see these people was to me like seeing a tiger. I was more afraid of my uncle Mahomed Latif than of the others, as he was more severe with me in my lessons. At first the letters were traced on a board, without any ink in the pen, and I followed over the tracings with ink in order to became acquainted with the proper shape of the letters, till after a time I could write the letters correctly.

---

[*] Translated from the "Hikayat Abdullah bin Abdul Kadir Monshee," by T. Braddell, Esq.

[†] Described in the preceding chapter, being sickly he had a board with a pen and was allowed to amuse himself in writing or copying letters from the alphabet

[‡] At page 18 of his work Abdullah says—"At that time in Malacca my paternal grand-mother was the Chief School-Mistress in Campong Pali and she had about two hundred scholars in her school."

When my grand-mother saw that I could read and write, she made me monitor to be over the other boys, and to hear them their lessons, thus I was employed all the day long, from morning till night, and I could now write from dictation. All the boys who asked me to assist in their lessons used to pay me, some in money, and some in eatables, so that I got work by my knowledge, and the fruits of that work. In the school none of the boys dared to gainsay my word, for I was their instructor. At that time Arabic was alone taught, and, from the times of our forefathers, such a thing was never heard of as teaching the Malay language in schools.

In the school there were various modes of punishment for faults committed, and various instruments used; first there was the rattan, then the "Chinese crusher," that is, an instrument made with 5 pieces of rattans, which are tied close together at one end, and through the other end of each rattan a cord is passed; the punishment consists in placing a boy's fingers between the rattans and, pulling the cord, compressing or crushing the fingers, this punishment is inflicted for theft, and for beating each other. Then again there is the "kayu palit," that is, a round stick about half a fathom long, bored with three holes, one at each end, and one in the middle, a cord is passed through, and knotted at each of the outer ends, and then passed through the centre hole. The punishment consists in placing a boy's feet beside the ends of the stick, and then tying them to the stick with the cord which passes through the centre hole, and, when thus fastened, beating the soles of the feet with a rattan;—it is inflicted on boys who scheme from school, or who climb trees, or who make faces at their companions. Again, there is an iron chain, about a fathom or more in length, fastened to a block of wood, the other end of the chain is also fastened at the end of the block of wood; the punishment consists in fastening the chain round the boy's waist, and making him carry the block of wood on his shoulders round the school; sometimes the boy is not allowed to go home, but is confined with the block of wood at the Master's house, and his rice is sent to him there; it is inflicted on boys who run out every now and then from school, on boys who are always fighting, on boys who do not pay obedience to the instruction of their parents, and on boys who are slow in learning. Another is "singang" that is a punishment for boys who are of bad disposition and who are incorrigible, they are made to hold their ears with their hands, the right ear in the left hand and the left ear in the right hand, and thus made to sit down, (on their haunches on the floor) and rise up, a great many times without stopping. There is another punishment for idlers, a dry cocoanut husk is set on fire, and made to smoke, and over this smoke the boy's head is held, sometimes dry Chinese chilli pepper is added, the smoke and pungency of the pepper entering the boy's nose and mouth and eyes cause him great pain. There is another punishment for boys who misbehave in school; a rope is tied round their waist, and then fastened to a post of the house; in this state they are made to learn their lessons, and are not let loose till the lesson is learned, their rice being sent there to the school by their parents. There is another punishment for very bad boys, and those who run away, and resist the authority of the teacher, and who steal, they are hung to a beam over head by cords round both wrists, and their feet are not allowed to touch the ground. There is another punishment also for very bad boys, they are laid down on their bellies on the ground, and flogged with a rattan. The punishment for boys who are great liars, and who abuse people, is to have chilli pepper rubbed in their mouths. All these punishments must be inflicted by the school-master in the school, there is no distinction made between the sons of the rich and the poor; the school-master can punish them even to the drawing of blood, and no complaint will be against him because he instructs well.

When a child is to be placed at school the father or mother first visit the school-master, taking a salver containing sirih, and a tray of sweetmeats, together with the boy who is to be instructed. Addressing the school-master, the father or mother of the boy says, "Sir" (or Master) there are two things I wish to stipulate for this boy, first don't blind him and second don't break his limbs—for any thing else you can please yourself." Then he or she orders the boy to sambah (pay obeisance) to the school-master; on this the school-master reads the prayer of prosperity (from the Koran) over the boy, the sweetmeats are divided among the school boys, the money brought on the sirih salver is taken by the Master, and the flowers divided among the school boys, but it is not necessary for me to enlarge on this subject, and on the customs of the school-room, for clever people don't like long stories, they look for reasoning and explanation alone.

After I had been at school 8 or 9 months I made progress in reading and writing, and the path of knowledge began to open up before me. Every day, after school at 12 o'clock, I used to make kites, of the cocoanut leaf, and sell them to the boys, one for a doit; with this money I bought eatables and fruit. The way I was able to make these kites was from being able to paint flowers and pictures on them; at that time I was well practised, had learned from seeing Chinese tradesmen painting pictures and flowers, and now painted these pictures and flowers on the kites. Other people made kites for sale, but little boys preferred to buy from me, others made their kites of patches of red, green and blue, but I made all mine of white paper and had colours ready to paint them, according to demand. When a boy came to purchase, I asked what drawing do you want, some would say an elephant, some a bird, some a fish—each indeed according to his fancy; on this I would paint them off and the boys preferred to buy from me. In this way I collected money for my expences, and besides I made money by writing the boards for the boys. In this way I went on till I finished schooling.

My father ordered me to go every evening to the Mosque after evening prayer, to read the Koran, for, said he, there are hundreds of people going and coming at the Mosque, and whoever hears you making mistakes will doubtless correct you. I did as I was directed for a long time, and after some months, my father and mother arranged with all their relations that I should undergo the ceremony of circumcision. When every thing was arranged, all the male and female relatives of my father and mother in Malacca, were called together in a large assembly, clothed in all manner of fine garments, with gold and silver. I was introduced, and examined as they thought fit; my school-master was there and there were some clever people, who asked me questions concerning the reading of the Koran, the accentuation, and all manner of things. After I had given my answers the Imam or Khatib read the prayer for prosperity, and on this I was directed to make obeisance to my school-master, and then to my father and mother; a suit of clothes was presented to the school-master rolled up in a cloth, there was a bajoo, a handkerchief, a pair of shoes and a sum of money about 10 or 20 dollars. These things were brought and placed before the school-master, and he was asked to accept of them, as an offering for his having instructed me In addition to these there were many circumstances which I have not mentioned here. On that night they put "henna" on my nails like one about to be married, for my father and mother made much of me, as I was their only child. The next day hundreds of people were invited and feasted, and at night a procession was formed, hundreds of people mounted on conveyances and thus we went round the town and back. The next day again they were all invited and feasted. The prayer for prosperity was read, the operator prepared his knife, the operation was performed, and 7 days afterwards I bathed again, and could walk. A gift of clothes was presented to the operator, with 3 or 4 dollars in money, he continued to come frequently till I was well, when he ceased his visits.

About a month after I had become well, my father desired the school-master to teach me the Kling language, with its writing; that is the Hindoo manner of writing, (not the Arabic Musulmanee) for it was the custom in Malacca, from the time of our forefathers, for the children of the wealthy to be instructed in that language, which was useful as the means of learning arithmetic, and as the means of communicating with the Klings, who, at that time crowded to Malacca in great numbers to trade. Many of them made fortunes in the Malacca trade, and on this account, the name of the Klings was famed, and every one desired his children to be instructed in their language. There were four chief races in Malacca, each race had its Captain, thus the Captain Kling, the Captain Malayu, the Captain China and Captain Nasarani. This custom took its rise under the Dutch rule, if any one had a complaint it was first taken to the Captain of his tribe, and if the Captain could not settle the matter, it was then sent up to the Fiscal, after that to the Feitore (Resident). Formerly in Malacca, the people of all classes and tribes were exceedingly well behaved, if a boy committed any fault whoever saw him was entitled to correct him, provided he informed the boy's parents, in a proper way of the fault, and of the punishment; petty cases were allowed to be settled by the elders of the campong who were appointed for that purpose by the Captains of tribes, and any thing happening in the Campong was reported to the elders in the first instance.

For two years and six months I remained reading and writing the Kling language. I suffered very severe punishment during this time, how often was I slapped and scolded, and with the tender points of my finger made to write in the sand, as those people (the instructors) dared not change the custom, which had obtained from times of old, for the forefinger to be used instead of a pen; to use a stick or any other way of writing would be a serious fault, for in the ideas of those people, it is better that the finger be worn to a stump in writing, than that an ancient custom should be altered. It pleased God that I should profit by the lessons of my instructor in the Kling language, and my parents accordingly rewarded him in the usual manner, with gifts of clothes and money.

During the time I was learning Kling in this way, my father charged me strictly to attend the Mosque at 5 daily times of prayer; and if he missed me from the Mosque at any one time of prayer, I was certain of getting a rattaning. At that time I would rather have met a tiger than my own father. I dared not speak to him, his wishes and orders were always conveyed to me through my mother. I was very happy in sitting with her, and conversing and amusing myself; but I was obliged to eat my meals with my father, and if I was absent by chance, he would wait, and not eat, till I had been called, and had arrived to eat with him. One day my father directed me to take a pen and ink and a sheet of paper, and to go every day to the Mosque, and write down the names of all who entered, and bring the paper to him every evening. When I heard this I was much surprised, and asked myself, what is the use of my going to write down the names of all these people? However my mother replied that she did not know, but that those were my father's commands, and they must be obeyed, and the sooner I set about it the better. I thought in my heart that my father was treating me with injustice; I had not a moment's leisure, or cessasion from work, I cried and my mother said, my son is it not better that you should suffer a little in learning now, than that hereafter you should be without any means of gaining your livelihood? This was my daily life at that time. Every night I went to shew my father the names of the people I had written down, I then got many slaps and much abuse. Any of the names which were spelled wrong were tied round my neck, in order to put me to shame. After about a month however of this training I was able to write all the names correctly.

One day my father himself directed me to go and bring a pen and ink, and a sheet of paper. When I had brought these articles as directed, he told me to sit down, and write from his dictation; when I heard this my heart palpitated with fear, as he had never down this before. However, like it or not like it, I sat down, and wrote whatever he said, for about 2 hours, when he took my paper and looked over it, with a very sour countenance. He said at last, well I shall let you off to-day, but to-morrow if there are any faults, you shall get a slap with the rattan for each. He marked off all the errors, the mis-spelling, and wrong placing of dots at the letters, and wrong formation of letters, and finished by telling me to come every day for the same purpose. I was exceedingly grieved because I could not go to play as usual.

The next day the lesson was continued, put in different words, he picked out words and phrases I had never before heard of and made me write them all down; I was abused and bullied and called dog, and monkey, but he did not beat me with the rattan any more. Every day the work became easier to me, and at the end of 2 months I could write correctly. After this I was instructed in the meaning of words, and the proper way to use them. The meaning of a word, if placed in a certain position may be different from that if placed in another position, but I shall not enlarge here how I suffered in acquiring all this knowledge, and on all the difficulties I had overcome; it was like drawing a bamboo tree along the ground by its top. I was thin, and my eyes were sunken, because of too much study, and because of disappointment in not acquiring knowledge, and because of shame at anticipated anger and punishments; for these reasons, as I have bought knowledge dearly, I must sell it dearly. Had I acquired it along the roads, or in an easy, playing way, I should not now wish any one to pay me for it; I should give it for nothing.

If one gets a jewel of little value he is ashamed of it, but if one gets a valuable treasure, he is of course proud of it. Are not diamonds stones; why therefore are they sought after by all men—is it not because of their brilliancy?

One day my father said to me, uow don't you be going about idling any longer, I have bought some paper, you take it and write out the Koran, in the house, and he shewed me how to do it. On this I sat down and wrote, and in the work how many presents and compliments and perfumes did I get; the presents were rattanings, the compliments were abusive language, and the perfumes were sour faces and grumbling every day. After about 7 months spent in this way, being corrected wherever I was found in error, I could copy out the Koran or any book correctly. When my father saw that I could write the Koran correctly he said, now here is an exceedingly fine Arabic and Malay book, copy it out. I took it in hand, and after a certain time, finished it. Every one else who saw my copy said it was very well made, but my father did not cease to jeer me about it; he said, look at the way you write, its just like the scratching of a hen's claws—a little child could write better than this; he made the worst of every thing, nothing was good in his eyes. I now understand the wisdow of my father's plan, he did not wish to compliment me for my wisdom or cleverness, as he feared it would make me vain.

At that time all the the seapoys in Malacca were Bengallies and Hindostanies, among them 3 parts were Mahomedans, and one part Hindoos. Among the Mahomedans all of them read the Koran, and performed the proper prayers. Some of them came to my grand-mother's house to engage my uncles to copy out the Koran. I also employed myself writing with them, and I was in great spirits at getting paid for my labour; I became very assiduous, taking no rest day or night, till my father became angry with me and told me not to accustom myself to write at night, for I should very soon lose my eye-sight and, by day-light, not to work too much, as I was young and it might injure my health. At this I was also angry, as the longer one is in doing work, the longer it is before the money comes in. I continued by stealth to write as I was fond of getting money.

There was one trouble I had, I did not understand Hindostanee, so that if I wished to speak to any of that nation, even in shaking hands with one of them, I was like a dumb person; and at that time the knowledge of the language was a valuable accomplishment. On this account I was very anxious to learn the language, and I told one of the head men that I wished to learn his language, he said, come then to my house in the fort, I will feed you, and have you taught by my religious instructors and you, in your turn, will instruct us all, and write out the Koran for us to purchase. I told my mother of this proposition, and she informed my father who said, very well, let him study Hindostanee, it will afterwards turn to good account

I went and resided in the Fort, for my uncle was there with me, two or three days at a time I would return home, I eat and drank and wrote and studied Hindostanee there. They gave me money and ghee and rice. I was a great favourite with all the seapoys, and was acquainted with them all, they were at that time very numerous with their wives. I remained about 3 or 4 years in the fort with them, and it pleased God to permit me to acquire the language, I daily conversed with them in their own language. They called me Moonshi, that is instructor in languages, and from that time till now the name has stuck to me.

After a short time I was taken home by my father, and he set me to read Malay books of all kinds, and every three days he examined me in what I had read. I was thus kept very closely to work, and could not get any relaxation, or time for play. I had plenty of knowledge, 1st on religion, 2nd on language, its meaning, and the power of words. Every three days my father came to my place of study to examine me, sometimes he took up the subject of religion, and sometimes language, and questioned me on them. On those points with which I was acquained I gave answers, and when I was ignorant, he informed me. I thought one day, what is the use of me annoying myself in this way with study, so that I have no rest, and no amusement of any kind, and cannot even meet my play-fellows. I used sometimes when thinking of this to weep from sorrow, and to wear a sour expression on my face, till my mother seeing me, from the inner chamber one day said, what is the matter, what are you crying about? I answered it would be better to die, than live in this manner, other children are not treated in the way I am. She answered,—how, are you not fed well, and clothed well, and does not your father take proper care of you, and bring you up well according to his means? you are crying for nothing. I answered, although you should feed me on gold, if I was not pleased it would be of no use; she said, what is troubling you now? I said, look at my father, he makes me study every day, I have no rest with him, he won't allow me to meet with my play-fellows, I might as well be in a grave-yard day and night. When my mother heard me say this she put her arms round my neck, and kissing me, said, my child don't be foolish, are you not yet young and of weak understanding, you are young now, and don't understand the value of education; in a short time you will find out the use of all this training, and the pains and trouble your father and mother now take with you.

Are you not our only child? and if you did not learn the Koran, and how to read and write, like the children of other respectable families, you would hereafter feel the loss, and would blame your parents for neglecting to secure your welfare, by giving you a suitable education; the recollection would be more bitter to your thoughts than gall, whereas now you will at a future time reflect on your present troubles with a relish like honey in your mouth, and you will then bless the goodness and foresight of your parents. If we were to leave you untold wealth, if you are not fortunate, it would soon disappear, and leave you in poverty, bnt knowledge and instruction are not so, they will remain with you as long as the breath remains in your body. What my mother said was exceedingly true, but it is only now that I know the real advantage of knowledge. While thus engaged in conversing with my mother my father came in and the conversation ceased. It was always my father's custom to wear a sour countenance whenever he saw me, and he always liked to find fault with me in every thing I did, whether in writing or reading, or in any work, he found out all manner of errors. Other people complimented me, but if he heard them he would check them, saying, these people will spoil my child.

One day the Nakhoda of a vessel came to our house to look for my father to write out a bond for 300 dollars, due by him to a Chinese merchant in Malacca. That day my father was very busy at Mr Adrian Koek's house, and the Nakhoda sat down and waited for him till mid-day, when he went away for his dinner; after getting his dinner, the Nakhoda came back, and waited till evening. At that time I came out, and asked the Nakhoda from whence he came, and what he wanted? He answered, I am waiting for your father, I told him my father had plenty of work at Mr Koek's house, he said, what then shall I do, for I have agreed with him already to draw up this bond, and I wish to sail now. I said, well Nakhoda, if you wish I will try if I can write the paper for you. I ran in at once to my writing place and commenced to write; I asked for the Nakhoda's name, his companion said his name is Nakhoda Ahamed, (he himself would not mention his name) and the name of the Chinaman, and the place where the debt was contracted; when I had finished writing the paper, I brought it out, and shewed it to him, when he had read it his eyes sparkled, and he said this is correct, so I will sign my name in your presence; and accordingly he did sign in my presence, and when he was going away he put a dollar in my hand, saying, take this Sir, to buy sweetmeats. I took it rejoicing greatly to get such a reward for a few minutes work. The Nakhoda asked me if I was pleased, I said, thank you Sir. At this minute my father arrived, and when he saw the Nakhodah, said to him what is the news; when did you come. As soon as I saw my father coming I ran and hid myself in the inner room, and kept quite quiet, feeling very sorry for having dared to write out the paper by myself. The Nakhoda answered my father by saying I have waited a long time, ever since morning, for you; but your son, Abdullah, has done what I wanted. When I heard my name mentioned my heart beat quick with fear, as perhaps I might have done wrong; I had never yet made a letter like this. When my father looked at the paper he smiled, and said, ah this mischievous boy is making himself useful; you can make use of this letter, take it to the person to whom you owe the money; on this the Nakhoda went away. My father entered the house smiling and looking pleased, my mother said, what are you smiling about? my father said, if I had got one thousand dollars to-day I could not be more pleased, my son can now assist me, and he then related the whole affair of the letter to my mother. They laughed together, and prayed that God might increase my knowledge and abilities, my father said—now for the first time I really have a child. If he did not know the Koran, and how to write, but remained ignorant, I should have considered him as dead. All this conversation between my father and mother I heard from the chamber where I was and then, for the first time, I felt the love and affection of my parents for me, and knew the use of all the teaching I had received, and of all the labour and pains I had to undergo in learning, and that the instruction of my father and mother was good and proper and correct.

After a little my father came into my room with a sour face, and said what is this you have been doing to-day in my absence? you don't know anything about writing papers, and yet you must needs write out a paper for Nakhoda Ahamed of Siak; and how many errors were there in the paper, which I had to correct myself. I thought at the time that I knew the meaning of all this, my father was exceedingly anxious to prevent me from becoming vain, or proud of my accomplishments. But, after that day, people coming to the house, to have letters written, or notes of hand, or Powers of Attorney, or Wills, or any writings of that nature, were referred to me to attend to their wishes. At first my father used to dictate to me a little, what I was to write, that is the heads, and left me to compose myself. There were slight mistakes in the first and second attempts, but, after that, every thing went on well, and my father made over entirely to me his writing box and apparatus.

THE
JOURNAL
OF
THE INDIAN ARCHIPELAGO
AND
EASTERN ASIA.

ETHNOLOGY OF THE INDO-PACIFIC ISLANDS.

By J. R. LOGAN:

LANGUAGE.

PART II.

THE RACES AND LANGUAGES OF S. E. ASIA CONSIDERED IN RELATION TO THOSE OF THE INDO-PACIFIC ISLANDS.

CHAPTER I.

INTRODUCTORY.

[*Prefatory Note.* In May 1850, finding that the time necessary to revise and complete my review of the Ethnology of the Indo-Pacific Islands would, from various causes, be longer than I had anticipated, I published a rapid sketch of the views to which I had been led by a comparison of the insular languages and races with the allied ones of the continents that surround Oceania. These views were not adopted without a more extended and minute comparative analysis of the structure of the cognate continental and insular languages and collation of their vocabularies, than had previously been undertaken, à labour for which the accumulation of a large body of original data, with the facility of reference on the spot to individuals of E. African, S. Asiatic and numerous Oceanic tribes, gave me considerable advantages. Without these, indeed, I should not have ventured to enter a field pre-occupied, and, to appearance, exhausted by the research of William von

Humboldt. I early saw that, without greatly enlarging our knowledge of the insular philology and embracing the surrounding continental languages in the comparison, no marked advance could be made on those conclusions, based on all the data accessible to European scholars save some recent and inconsiderable additions, to which that great ethnologist had arrived, confirmatory as they were of the opinions that had previously been adopted by the cultivated and cautious mind of Marsden. In the prosecution of the labour in which these considerations induced me to engage, I was led to digest and compare all the grammars and grammatical notices within my reach for the Chinese, Ultraindian, Indian, Ugro-Japanese, African and American languages and to form a comparative vocabulary of some extent. This comparison not only threw a new light on the languages and ethnology of the islands, but disclosed some relations hitherto unsuspected amongst the continental languages also. Certain of these are briefly shadowed forth in the introductory paper in question. I was especially struck with the constantly accumulating evidence of the derivation of the leading races of the islands from Ultraindia and India, and was led to the conclusion that the basin of the Ganges and a large portion of Ultraindia were occupied by tribes akin to the Malayu-Pylynesian before the movement of the Arian or Indo-Germanic race into India. The combined and consistent evidence of physical comformation, language and customs placed this beyond doubt. When I first suspected the existence of this intimate connection between the Himalayan, Gangetic, Ultraindian and Malayu-Polynesian tribes, the materials for a comparison of the insular with the Gangetic languages were very scanty. I was hence induced to apply for copies of the manuscript vocabularies of the dialects of Eastern Bengal collected by Dr Buchanan Hamilton and which lay neglected at the India House, offering to publish them in this Journal. But I was dissuaded from the project and informed that there was no connection between these Gangetic languages and the Oceanic. The publication of new materials in the Journal of the Asiatic Society of Bengal enabled me to make a satisfactory comparison of the two linguistic alliances and it then appeared to me that the best mode of attracting attention to this important relation would be to lay a brief account of the evidence before the British Association and solicit its aid in procuring the publication of all the manuscript vocabularies extant. I therefore in July 1850 entrusted a paper on the subject to the good offices of Professor Jameson of Edinburgh, to be read at the meeting of the Association to be held there that year. The paper did not reach Edinburgh until the meeting had closed. It was read before the Royal Society of Edinburgh in January 1851, and a notice of it was published in Professor Jameson's Edinburgh New Philosophical Journal (April, 1851, p. 371) with the following abstract or table of its contents :

"Traces of an ethnic connection between the basin of the Ganges and the Indian Archipelago, before the advance of the Hindus into India; and a comparison of the languages of the Indo-Pacific Islanders with the Tibeto-Indian, Tibeto-Burmese, Telugu-Tamulian, Tartar-Japanese, and American languages.

I.—Preliminary Enquiries.

1. Principal Continental connections of the archaic ethnology of Asianesia.

2. Physiological and moral evidence of an Indian connection.

3. General ethnic principles and tendencies observable in the ethnology of Eastern Asia and Asianesia.

   a. Mutual physiological and moral action of tribes.

   b. Linguisitic development and mutual action of tribes.

4. Character of primordial Phonology. Remnants of it in S. E. Asia.

5. Cause of the transition from the monotonic to polysyllabic glossaries.

6. Comparative value of Structural and Glossarial comparisons for ethnology. Superiority of the Glossarial. Supreme importance of Phonology.

II.—Phonetic and Structural character of the Archaic languages of India.

7. Prepositional and postpositional languages.

8. Character of the Tibetan and Burmese with relation to each other and to the Tartarian and S. E. Asian languages.

9. The N. Gangetic or Himalayan languages.

10. The S. E. Gangetic languages.

11. The S. Gangetic languages.

12. The Telugu-Tamulian languages.

13. Comparison of the Telugu-Tamulian with the African languages.

III.—Phonetic and Structural Character of the Asianesian Languages.

14. Australian.
15. Polynesian.
15.* Papuanesian.
16. S. and S. E. Indonesian.
17. N. E. Indonesian.
18. W. Indonesian.

IV.—The Asianesian Languages compared with the American and Tartar-Japanese Languages.

19.* Asianesian compared with the American languages.

20.* The Asianesian compared with the Japanese, Korian and Tungusian languages.

Sub-sect. 1. Japanese.
—— 2. Korian.
—— 3. Manchu.
—— 4. Results.

V.—Ethnic Glossology.

19. Principles of glossarial comparison.
20. Character of Asianesian glossology.
21. Permutations of sounds.
22. Comparison of Definitive, Segregative, and Generic words or particles.
23. Pronouns.
24. Numerals.
25. Names of parts of the body.
26. Names of Domesticated animals.
27. Miscellaneous words.

Conclusion.

From a brief notice in the Athenæum I learn that at a recent meeting of the Royal Asiatic Society, Mr Laidlay read a paper on the subject of the change from monosyllabic to polysyllabic languages, in which views appear to have been maintained similar in some respects to those which I had previously announced in the above paper, and also partially in this Journal. The field for ethnic research presented by Southern Asia and Asianesia is so great that there is ample room for a hundred labourers and the subject is so large in its details and so complex in its principles, that no one can enter upon it zealously without being rewarded by interesting results. I place a much higher value on a regular and systematic comparative investigation, like that in which Mr Hodgson and I believe Mr Laidlay also are now engaged, although it may not yield immediate fruit, than on striking discoveries made in a particular direction, and I have consequently made it a rule as much as possible to work out the whole subject of the relation between the insular and the continental languages in a systematic manner, and not to allow myself to be led away from it by the desire of an early publication of results of more than ordinary value or interest. On the present occasion, however, I feel that I should run some risk of exposing myself to the charge of having adopted the conclusions of others, if I were to remain silent until Mr Laidlay's paper had been published. On seeing the notice in the Athenæum, I immediately sent to Mr Norris, of the Royal Asiatic Society, a copy of that portion of my own paper relating to the same subject, with a request that it might be laid before the Society. It was not my intention to introduce it into the present enquiry, but to place it in a modified form, and after further investigation of the subject, in the separate series on the Ethnology of Eastern Asia, the 1st Chapter of which contains some remarks explaining the importance of such an investigation for the Ethnology of Asia.*

But the above considerations have induced me to insert it at once and as it stands, even at the inconvenience of somewhat deranging the plan of the present series. The earlier portion, therefore, of this chapter, from the paragraph noted in the text, is a republication of so much of the preliminary chapter of the paper read before the Royal Society of Edinburgh as relates to language, without any alterations or additions, not merely verbal, save what are marked by brackets. The remaining chapters are based on other portions of that paper, but considerable additions have been made. The general glossarial comparison of the definitives, pronouns, possessives, directives, time particles, numerals &c in the Asiancsian, Chinese, Ultraindian, Indian, Tibetan, Ugro-Japanese, (Turanian) Indo-Germanic, and Africo-Semitic alliances has been postponed, as it will form the concluding chapter of the present series. I deem it proper, however, to say that this comparison shows that an intimate fundamental connection exists amongst the particles of all these languages, that there are special connections between the Indo-Germanic and the Turanian on the one side and the Africo-Semitic on the other, and that the Asianesian particles are chiefly connected with the Africo-Semitic, although they have also distinct connections with the Ultraindian, Indian, Tibetan and Turanian.

The publication of this portion of the review out of its regular order has compelled me to make some additions to the 1st chapter, in partial anticipation of the conclusions contained in the last section of the preceding unpublished chapter. That chapter embodies the supplement to chapter III. and consists of a separate view of the languages of each considerable island and island-group of Asianesia. Its revision has been completed, with the exception of one section, and it will follow the present portion of this paper, if possible without interruption. But fresh data have been received at every stage of my labour, necessitating additions and alterations, and I may be induced to delay the chapter in question with a view to the incorporation in it of some valuable vocabularies which I am promised from Borneo and some which I have received for that island and the Moluccas since the previous part of this note was written.

The portion of the review of Indo-Pacific ethnology now published consists of a comparison of the insular languages with those of China, Ultraindia, India and Tibet. The attempt to define the ethnic position of the S. E. Asian formations relatively to each other, to the conterminous Asiatic formations, to the African,

* The Ethnology of Eastern Asia. Journ. Ind. Arch. Vol. IV. p. p. 441, to 446.

American and Asianesian, has rendered it necessary to glance at the other formations of the Continents, so that the following subjects are embraced in it,—1st, the mutual action of races and linguistic formations with special remarks on the change from monotonic to syllabic languages; 2nd, general remarks on the physical characters of the tribes of S.E. Asia; 3rd, general character of the languages of China, Ultraindia, Tibet and India; 4th, the successive linguistic formations of India and Ultraindia—A. the Dravirian, embracing a comparison of the Dravirian with the Turanian, Caucasian and Semitico-African languages—B. the South Ultraindian, or Mon-Anam—C. the Tibeto-Ultraindian or Burma-Himalayan—D. the Tibetan. The ideologic and phonetic comparison is followed by a glossarial one embracing—1st, pronouns, definitives, and other particles; 2nd, numerals; 3rd, miscellaneous vocables, consisting chiefly of Mr Brown's list of 60 words. It is proved, I think satisfactorily, that the first recognizable formation in India and Ultraindia was the Draviro-Australian, that the Vindyan and Gangetic languages retain a strong Dravirian character, the Gond, Khond, Uraon and Male or Rajmahali being still mainly Dravirian while the Kol dialects, the Dhimal, Bado and several of the languages around the valley of Assam are mainly crosses between Dravirian and Ultraindian. It is next shewn that the earliest post-Dravirian formation of Ultraindia was monosyllabic and prepositional, but modified in some instances by the influence of the prior Dravirian. This formation, which may be termed the Mon-Anam was an extension of the formation of Southern China and is consequently closely allied to the Lau or Siamese which originated in Yun-nau. The principal remnants of this formation are the Anam, the Kambojan with the adjacent Kha, Chong &c (a sub-alliance which appears to have extended over the Me-nam basin or Siam prior to the southern migration of the Siamese), the anciently conterminous and closely allied Mon or Peguan, and the Kassia. This formation was distinguished by its prefixed definitives *ka*, *ta*, *pa* &c. which are largely preserved in the Manipuri, Naga, Jili and Gangetic languages including some of the Nipalese. Its vocables are not only found in all these languages but to a remarkable extent in the Kol dialects, proving that the Pegu formation embraced Lower Bengal and a portion of the Vindyan although the Dravirian basis was preserved in the languages of the latter. The same formation embraced the languages of the Nicobar islands and the Malay Peninsula (Simang, Binua) and at an early period it spread over the eastern islands from Sumatra to Polynesia, although in some islands the archaic Dravirian and in others the intermediate African and Malagasi remain as the linguistic basis. The next Ultraindian formation was the Tibeto-Ultraindian which is distinguished from the Mon-Anam by its Tibetan or post positional and inversive character. It embraces the Burman, the Karen, the Yuma dialects from Kyen to Kuki, the Manipuri, Naga, Mikir, Singpho, Mishmi and Abor-Miri. It also spread westward up the Gangetic basin and into that of the Sutledge, the Garo, Bado, Dhimal, the Akha Changlo and the other Himalayan languages as far westward as the Milchanang and Tibberkad belonging to this formation so far as they are not Dravirian, Tibetan or Arian and so far as they do not preserve remnants of the Mon-Anam formation, the latter being slight on the north side of the Gangetic valley compared with the south or Vindyan. This Tibeto-Ultraindian formation I conceive must have originated at a very ancient period in eastern Tibet or the adjacent territory now Chinese, because it is intermediate between Chinese and Tibetan and more closely connected with the latter than the former. Burman appears to represent this formation in a very archaic condition while Tibetan shews it modified by the influence of the allied and phonotically more advanced Turanian languages. In the Manipuri, Naga &c it is mixed with the earlier Ultraindian formation. The trans-Himalayan location of the mother formation of the Tibeto-Ultraindian languages (Burman &c.) explains the special non-Tibetan affinities between the Ultraindian members of the formation and the Turkish, Mongal, Samoiede and other Mid and North-Asian languages. The tribes from which the Burmans and the allied Ultraindian and Himalayan nations were derived must have been long conterminous with the Turks and other momadic races which successively occupied eastern Tibet and north western China. The last formation which I consider is the Tibetan. The Tibetans appear to have crossed the Himalayas in the earlier centuries of the Christian era, subduing the prior tribes of the Burman or Tibeto-Ultraindian family, and even extending their sway into the vallies of the Ganges and Brahmaputra. Hence we now find on this side of the Himalayas purely Tibetan tribes and dialects, and Burmah-Himalayan tribes and dialects crossed by Tibetan. The Tibetan influence may even be traced in the languages of the Gangetic and Asamese vallies and in some of the Ultraindian languages, although the Tibetan elements in all of these belong mainly to the more ancient Tibeto-Ultraindian formation. The influence of the Chinese race, civilization and language on the Tibetan is glanced at. Lastly I consider the question how far the various pre-Arian formations of India and Ultraindia have affected the population and languages of the Indo-Pacific islands. In the glossarial comparison of the various formations I have mainly confined myself to the generic particles, definitives, prefixes, postfixes, pronouns &c. to the numerals and to Mr Brown's list of 60 words. These different vocables of the Dravirian formation are compared with those of all the other formations so as to throw light on the extent to which Dravirian prevailed in India and Ultraindia. They are also compared wtth Africo-Semitic, Caucasian, Ugro-Japanese and other formations, several of which (particularly the Caucasian, Samoiede and remoter N. and N. E. Asiatic) have remarkable affinities with Dravirian. The Mon-Anam vocables are in like manner traced in the other languages and so with the Tibeto-Ultraindian and Tibetan. Special comparisons are also made between the vocables of different geographical groups, as between the Vindyan and the South Dravirian, the Gangetic, the Himalayan, the Ultraindian &c. J. R. L.]

The Indo-Pacific islands advance from South Eastern Asia far into the Great Ocean that lies between the eastern shores of Africa and the western shores of America. They constitute a fragmentary southern peninsula like Africa and S. America, lying midway between these lands but covering a much greater space than either. An enquiry into the foreign affinities of the Asianesian languages must therefore embrace the whole basin of the Great Ocean, that is, all the systems of language prevailing on its African, Asiatic and American shores. We must even penetrate deeper into the continents than the river basins belonging to this ocean, because in the period that has elapsed since the continental languages first spread into the insular region, there has been much movement amongst the continental races, attended by changes in their distribution and by mutual linguistic modifications. As Asianesia has the closest geographical connection with the lands of the basin of the Indian ocean, I shall first briefly consider the characteristics of the S. E. Asiatic and the archaic Indian languages, and then enquire what general affinities they offer to the insular languages.

The Indo-European languages are a modern development which has expanded chiefly to the S. W., having partially occupied India and glossarially affected the languages of Asianesia. As the influence of Sanskrit on the insular languages is well recognized and is evidently recent, my enquiries will be chiefly directed to more ancient continental influences.

In the present crude state of Ethnology, and particularly of the linguistic branch, it is absolutely necessary for the enquirer to shift his point of view frequently, if he would avoid gross errors arising from partial comparisons and the undue prominence which each family of languages and class of affinities assumes when the attention is long fixed on it. For this reason I propose in the first place to take as independent a view of the S. E. Asian languages as a writer can be expected to do, who has for some years viewed Ultranidian and Indian ethnology as a subordinate portion of that of Asianesia. The Ultraindian tribes are so closely identified in race and position with the insular ones, that, although there would be some advantages in assuming the basin of the Irawadi as my first point of observation for the continent, I have preferred taking India as a centre. In the earlier chapters I shall therefore leave the islands behind for a time and endeavour to ascertain what the ethnic relations of the ancient Indian races were. I shall revert to the insular tribes and languages only so far as they may help to trace the course of archaic Indian history, and the Ultranidian, Chinese, Tibetan, Ugro-Japanese, Caucasian, Africo-Semitic and American formations will be chiefly noticed with reference to their bearing on India and its normal races and languages. In future chapters I shall deal in the same mode with each of these formations, but much more briefly with all save the African, which is so intimately connected with the Asianesian that it will be necessary to discuss its languages as fully as the information within my reach will allow.

The relations of the S. E. Asian formations to those of the rest of Asia, are involved in the consideration of the light they throw on the languages of Asianesia, and as these formations present almost the two opposite extremes in the development of language, it may be advisable to offer some preliminary remarks on the mutual influence, transformations and diffusion of languages. For this purpose I avail myself in the first place of the paper mentioned in the Introductory note.

The grand impression made on the mind by a contemplation of the races occupying any considerable region of the earth, as they now are, and so far as we know them to have been in past time, is almost the same as that received from a consideration of the distribution of the vegetables, animals and rocks of the region, as they are now and have been in past or geological eras. At first everything appears fixed. We note changes, but each is infinitesimally small when compared with the multitude of phenomena on which a character of permanancy, either from substantial stability or from constant reproduction and replacement of individuals, appears to be written. Some tribes have slowly improved or degenerated, but the great mass of human races seem to be nearly the same as they have always been. When, however, we sum up the current changes, when we bring into account the revolutions which we know to have taken place from time to time in the historical era, and when we multiply the whole amount of change which we are assured has happened in that era, by the long archaic eras which have preceded it, we conclude that natural causes are sufficient to reconcile the differences between existing human tribes, enormous as they are, with the belief that they all started from a common level of undeveloped humanity, without language and without arts, and this whether they belong to a single stock, as sacred history and science concur in proving, or to many different stocks. The human race, as a whole, contains, and always contained, the same elements of change and developement, not universally called into active or powerful operation, but requiring stimulating external conditions, the perpetual recurrence of which, in particular places, is a necessary consequence of the nature of man and of the globe which he inhabits. It is the force and extent of the operation of these principles only that vary, and take a direction from the physical geography of each region, and the relative numbers and civilizations of its tribes. The component parts of the race mutually act on each other, and every great principle of change that is excited into action in the bosom of one tribe, not only operates on it, and gives it a new ethnic place in the region, but directly involves other tribes in its influence, for all human development and excitement is contagious.

The relation of a tribe to the regions in which it is placed, and to the surrounding tribes, varies from era to era, as it depends not only on its own development but on that of other tribes in the same and in foreign regions. Physical geography in all ages, forms the material basis of ethnology, for by it not only the locations of small tribes in the lowest state of civilization, and their gradual extension and mutual action, but also the national movements and migrations, and the commercial, warlike and religious enterprize of more advanced peoples, are all, in a greater or less degree, determined or influenced. By its blending of mountainous lands with great steppes, rivers, lakes, sea shores and seas, it, in all eras, fixes, protects and, to a certain extent, secludes, some portions of the race, while it subjects other tribes to constant movements, intercourse with foreign tribes, the reception and communication of influence, and the frequently recurring necessity of conquering or being subjected, advancing or retrograding, assimilating other tribes or being absorbed by them, adopting each new development of intellect or art in the nations related to it, or falling behind them and preparing its own decay and final extinction.

Every tribe is naturally expansive. If no impediments existed, it would go on multiplying, dividing and migrating, till it gradually spread its physiological, moral and linguistic character over the world. The impediments are of several kinds. It may be located in a district that is physically secluded. It may come in contact with other tribes who are hostile to its advance and confine it within its native location. New developments may take place in some of its families long before it has occupied all the world and each of these will become a new and independent centre of expansion. The physical impediments alone, although exceedingly great to a rude race, would everywhere yield to time. At present, and in all historical ages, the ethnology of the world presents a most complex combination of variously expansive and of secluded or stagnant tribes and each ethnic region and district exhibits the same phenomenon in a smaller degree. The expansive power of one development expends itself within a limited space. It causes no revolutions beyond it, although within it tribes perish or are absorbed. The expansive power of another development, after embracing the district of its origin, or even before, operates on foreign districts and regions, and may ultimately spread its influence over the whole world. We may believe that in every great era there have been developments so powerful in relation to the general ethnic character of the era, as to give them a very wide and even mundane diffusion. This expansion may be a physical one, a dominant race may go on increasing in numbers as it spreads, so that in every new region which it enters, it shall have, or acquire, a numerical preponderance, and, in time, extinguish or absorb the indigenous tribes. Again its numbers may be relatively too small to produce this result, but its energy and influence sufficiently great to give it an ethnic predominance, and to propagate its languages, institutions, religions and customs, in a greater or less degree, and with many modifications, over the world. I need hardly add that every expansion produces some change in the various members of the expanding power itself. It receives as well as communicates influences when it moves into new regions and comes in contact with new tribes, and the mere lapse of time, in the long era needed for any mundane diffusion, must produce, in the numerous widely separated nations of the prevailing family, striking differences in language and in other respects.

Certain leading developments, having a well marked character, either physical, linguistic, moral or industrial,—and some having a concurrence of two or more of these characters,—can be traced in the ethnology of the world. Such is that which preceded the Indo-European and Semitic formations and which appears to have been of very great antiquity, and to have extended over the whole world. With its later eras the earliest civilization of Egypt is connected and the influence of the civilization of the Euphrates and the Nile which takes the next place, appears to have directly or indirectly spread far amongst the tribes of the earlier culture throughout Africa, pre-Arian India, many other parts of the Asiatic continent, Japan, and to have even reached America. The Chinese development, again, had a considerable influence in Eastern and Mid-Asia, the Aino-Japanese band, Micronesia and probably Asianesia generally.[*] The relation between the early Chinese civilization and the early Egyptian is well worthy of the deepest research. Lastly, the Indo-European development preserves the strongest evidences of its unity of origin and of its being very recent compared with the others to which I have adverted. With all the advantages derived from its lateness and consequent superiority in cultured intellect, science and art, particularly in geographical knowledge and in navigation, it has made small progress, in comparison with the more ancient developments, in imposing its languages, customs and creeds on the world. It appears destined, however, to attain an equal prevalence. If its progress, even to the present extent, has required several thousands of years, how much longer must have been the archaic eras in which less advanced formations, with few and inferior locomotive appliances, and with greater physical difficulties to contend against, were spread over the world by the slow and gradual communication of ideas and by the still slower transfer of men from district to district and from continent to continent.

---

[*] It has a strongly marked physical relation not only to all the races of the Mongolian type, but in a much closer or more special manner to the Tibetan tribes, the American Indians and some of the Eastern Asianesian tribes, in all which one of the prevailing Chinese types may be traced. Numerous examples of the elongated head, obtusely wedge-shaped cranium[†] and arched nose of America and New Zealand may be seen in every assemblage of Chinese in Singapore.[‡] The occipital truncation remarked in America and Polynesia is common in S. E. Asia. It is very strongly marked in the Lau race. The Tibetan tribes have the rise of the skull at the coronal region, but the other characteristics are wanting.

[†] When viewed from the front.

[‡] The heads of the American men in Plates XXX, XXXI, XXXV, XXXVI, and XXXVII of Dr Prichard's Natural History of Man are Chinese. I cannot speak as to the female heads, as Chinese women are not brought to Singapore. The prominent *lateral* expansion of the zygomæ is comparatively rare in the Chinese as in the Americans. The Sumatra Malays have much more frequently the typical

If we admit the probability of human history being very ancient, of several developments having thus spread over large regions or over the world, and of a long succession of extinctions and reproductions of tribes as of generations, we shall begin to understand the complicated mass of affinities and differences which the ethnology of every great geographical area presents when compared with that of any other. In each the later archaic history in some degree melts into the historical, or can be well explained or illustrated by the existing and historical ethnology of other regions. But those most startling and apparently inexplicable affinities which connect its tribes with distant ones, from all communication with which, direct or indirect, they have been immemorially cut off, can receive no other light from later ethnology save that which may result from a knowledge of the great ethnic laws and principles which it reveals and illustrates. We can never hope to read in them the remotest ethnic developments, movements and revolutions without a complete analysis and comparison of every language that has been preserved, a gigantic labour and one demanding a much greater number of workers, and above all a better directed and divided industry, than are at present brought to bear upon it.

Language is a natural and necessary attribute of the developed human intellect and organism. In its first origin it is imitative. Its sounds are entoned, chanted, varied, complex and often harsh, like those of nature. The oldest languages of every region preserve much of this phonetic character. It is not culture but organic

---

Mongolian head, as have also the allied tribes of the Irawadi-basin, with whom they are most nearly connected and whence they have undoubtedly derived their physical stock.

changes in families or tribes that weaken and gradually destroy this high phonetic energy and power, and induce a comparatively emasculated and poor, but generally more graceful and harmonious, phonology. Words were, at first, abrupt, independent, strongly intonated sounds, each representing a crude or concrete idea. The grammatical distinction of syllables is hardly more applicable to primordial language than is that of "the parts of speech." Every word is a unity, ideologically and phonetically. It is not syllabled but intonated and phonetically inflected, like natural animal and material sounds, by an imitation of which the rudiments of human phonology were obtained. S. E. Asia preserves many examples and illustrations of an early phonology, although after an elaborate culture during many thousands of years, we cannot expect to find in its languages, genuine representatives of a primordial one. Indeed the change that has taken place in a recent period in the Tibetan and Burman may satisfy us how far even their ruder dialects must be from the primitive phonetic harshness and complexity. These ruder dialects, however, preserve consonantal combinations or complex consonanted sounds, and the Chinese, Anam and Lau complex and difficult vocalic or tonic sounds, so that their speech still appears to us a strange barbaric chant.

The grand feature of polytonic * languages is the incapacity of phonetically combining words. If the races that possess them become highly civilized, the languages will necessarily become elaborate and rich in ideologic forms and powers, because the growth of intellect and language is one. But the tonic phonology will preserve the concrete ideology. So long as it remains, a language may ideologically receive the highest culture and elaboration which human intellect can give, but it cannot cease to be cumbrous and crude, and it is therefore incapable of adequately expressing the more subtle, refined and complex action of the mind. It may be full of the elements of all varieties of expression but it is rude and unwieldy. It is in this tonic impediment to the union of words, and not in any radical discordance in ideology, that the *essential* difference between the Chinese and the English, the Burmese and the Latin, consists. It is from this that all the other leading differences flow. Remove this impediment, and the words, hitherto crude, solid and isolated, are capable of becoming plastic, fluent, attractive, and assimilative, sentient of every variation of idea and of every change in other words brought into remotest relation with them. It is like the difference between the rude masonry of the Polynesian tribes without tool or cement;—nothing but rough and rigid blocks in which to body forth their highest conceptions, and the architectural triumphs of European art, in which grand and beautiful ideas, once but the inmates of the mind, have taken up their abode. Apart from the more powerful, delicate and subtle phonology, there is little in the Indo-European languages that is not to be found in the Lau-Chinese and Burmese. I place out of view the differences arising from the varying mental character and cultivation of races, because every great linguistic family possesses tribes which vary in this respect. In comparative ethnic philology we must look to the essential characteristics of languages, which are the same for the rude as for the civilised tribes of the race, for the ignorant and uneducated peasant, as for the man of letters.

---

* Polytonic in their general vocalisation, monotonic in single words.

Although a language that had lost the tones might acquire, by its own internal development, all the characteristics of the most polysyllabic languages, the Tartarian and Indo-European families appear to have possessed, in their tonic era, most of the elements of their present form. Whether in this era they were as richly and elaborately developed as the cultivated S. E. Asian languages may be doubted, but they appear to have shared in all the principal ideologic possessions common to those languages and the wide spread of which through tonic vocabularies that differ more than those of the Indo-European tongues, attests their great antiquity.

To shew that the change from the monosyllabic to the polysyllabic languages is purely a phonetic one [*], I shall mention some traits of the former which are repeated in the latter. All the polysyllabic, in place or in development, are mainly dissyllabic, while many contain a large number of monosyllables. Indeed even in the Indo-European languages most words are either monosyllables or dissyllables, with or without relational, auxiliary and connected words and particles phonetically united to them, but of which the independent meaning or office is still obvious, without the aid of ethnic philology, to every person who has studied his own language. This is precisely the character which the S. E. Asian languages would assume if the tones disappeared. They abound in words which are constantly coupled. These are chiefly of two kinds. The first are a consequence of two necessary characteristics of every cultured monosyllabic language; a richness in synonymes and analogues, arising from the necessity of giving a distinct word to every substantive idea for which independent expression is found useful or desirable; and an embarassing number of homophons, arising from the restriction of the phonetic elements to monotones. This leads to the habit of using two words to represent or distinguish one idea, and as that which in its origin is a matter of necessity, soon becomes a matter of taste, it is not surprising that these twin-words should have multiplied to a great extent. This habit has been preserved by many of the dissyllabic tongues. Numerous instances may be found in Africa, Asia and Asianesian. Some will occur in the sequel. The second class are the most numerous and important. All relations and modifications that most frequently occur in nature and to the mind must be most frequently expressed in speech. The most universal, generic or abstract are necessarily of constant recurrence, and the words which express them are consequently habitually attendant on other words. Words of relative quality, place or position, force (physical and mental), time, direction, those expressive of the relations in which man and other active or recipient substances, or natural and artificial forces and instruments, most frequently stand to other objects and to actions &c. must be habitually preplaced or postplaced to other words. The number and variety of such accessory words is very great in the Lau-Chinese and Burmese. The concreteness and multitude of radical words has called into activity a scientific or methodical spirit, which has pervaded the vast glossarial magazine, and seized on properties and principles which are common to many specific substances. By describing an object as subjected to an action, or as being possessed by a particular attribute, the mind removes the vagueness of the crude word. It transforms the indefinite specific name into the name of an individual, while homophonic mistakes are also thereby prevented. These " segregatives," like many of the other classes of accessory and generic words, become united to the specific words when the tones are lost and a harmonic phonology arises, and as the mind no longer leans upon them in working out the expression of its ideas, they first sink into the character of mere particles and ultimately merge in the words to which they are united. The universal, or constantly recurring, relations to place, direction, time, and to the will and desires of man, retains a distinct servile character and force as adfixes and (secondary) flexions. But the great mass, each of which embraces only a particular class of words or is expressive of relations that do not habitually occur, become initial and terminal syllables, of which the original meaning can only be recovered by philological analysis and research. In the monosyllabic languages the terminals of case, tense, mode, sex, and number, those distinctive of substantives, adjectives, adverbs, and verbs, and of one genus of these from another, all stand on the same footing as separate words (when they are glossarially expressed), with an abundance of others which are no longer recognisable in the more advanced inflexional languages, although numbers are doubtless preserved in those initial and terminal syllables which are now inexpressive.

---

[*] The remarks which I formerly made on the subject of the transition from monosyllabic to dissyllabic languages, with reference to the change which the words of S. E. Asia have undergone in Asianesia, are applicable to the same kind of change wherever it has taken place. "On the generation, &c of languages." Journ. Ind. Arch. vol. III p. 644 &c. [The words "in the insular races, owing probably to their separation from the continental communities," should be omitted in the first passage referred to (p. 644) as they were founded on a double misconception. See p. 646. See also the reference to this subject in "the Ethnology of Eastern Asia" Journ. Ind. Arch. vol. IV. p. 441, 442, 443.

While the fullest ideologic commentary on the Indo-European languages is to be found in the Lau-Chinese and Burmese, the best illustrations of the development of their phonology are to be found in the ancient Indian, Mid-Asian, African, Asianesian and American languages. The tonic languages contain, within their own circle, many illustrations of the mode in which the tones lose their supremacy and true dissyllables begin to appear. In the S. E. Asian languages we find most of the phonetic tendencies of the human voice and ear that are capable of working through monotonic words. Even in the Chinese family, which, in its consonantal character, is removed to a great distance from the primordial ruggedness, the opposite tendencies may still be seen. Many of the complex quasi-vocalic sounds, appear to be smothered consonantal combinations or inflected consonants, and there can hardly be a doubt that, in early times, they were fully uttered, and very harsh, and often complex, consonants. In some of the languages and dialects the terminals *k*, *l*, *r*, *b*, are common, while in others the emasculative tendency is so great, that, in general, only terminal vowels and nasals occur. The curt and hard or consonantal phonology uses *k* for *ñg*, *t* for *n* and *p* for *m*. The Anam syllables are also in general either vocalic or nasal. But, as in the Chinese popular pronounciation, the consonants *k*, *t* and *p* are also found as terminals, and, in addition, *ch*. The Siamese participates in the same characteristics. The syllables are mostly naso-vocalic and vocalic consonants. A considerable proportion take the terminal, guttural, dental and labial surds, like the Chinese and the Anamese. But the consonantal tendency is more strongly developed, for final *r*, *s* and *b* also occur. The after-breathing of consonantal terminals is sometimes fully vocalised, so as to form an additional syllable, and out of this a repetition of the consonant has even been generated. In this consonantal echo a new but natural phonetic tendency is developed, fatal in its extension to the preservation of the monosyllabic character. The prevalence of terminal consonants renders the Siamese syllables much more numerous and varied that the Chinese. The combinations of vowels, are also more numerous. This superior phonetic basis frees the language from that (strong) necessity of using homophonic words which forms so prominent a defect of the Chinese. A slight approach to phonetic combination of syllables and words is exhibited. When two words are used to express one idea, the second is somewhat longer in quantity than the first, the after breathing of the first being cut short by the second word. Not only does the voice rest a little on the latter, but in rapid speaking there is even a slight shifting of accent*

---

* It should be remarked that in rapid speaking the tones are obscured. Col. Low observes that some words are varied by many tones while others are not sub-

Phonetically therefore the language is of extreme interest, as exhibiting the rigid monotonic habit giving way to the dissyllabic tendency. It is thus a living illustration of the operation of those natural laws which convert monosyllables into dissyllables, and in doing so, destroy the tonic character on which the preservation of monosyllabic languages depends. In the Burmese and the northern languages allied to it the tones are few and the dissyllabic tendency gains strength. In the languages of the mountaineers along the southern side of the valley of Assam dissyllables become abundant, although in some a large portion of the vocabulary is still monosyllabic. On the northern side of the valley the tones are lost, but it does not appear that the essential principle of all advanced phonology, the moveable accent, through which the life of the principal word flows into the accessory graft and makes it one with itself, is developed in them, at all events it is wanting in the Tibetan.

In all the S. E. Asian and Asianesian languages in which the tones have decayed and the phonology has become free and acquired a degree of vital power, we see the dissyllabic tendency (frequently) manifested through it alone. Monosyllables, by the strengthening and vocalisation of the initial and final breathings which accompany every consonantal action of the voice, are converted into dissyllables. A numerous class are also formed under the influence of that love of echo which pervades Asianesian phonology, as it does that of all the harmonic languages, Fino-Japanese, African, &c. In the Malayu, for instance, most of the radical dissyllables, or those which have not been formed by the unitising of twin words, have an original syllable and a secondary one which echoes the vowel of the former.

Passing from these general philological remarks to the light which languages throw on specific ethnic history, I may state, as the conclusion to which I have been led, that the great majority of the known languages of Eastern Asia do not stand in any definite relationship, in the ascending and descending line, to each other. The evidences of a much greater nearness in remote archaic times are abundant, but each has had its own separate internal development and external modifications for many thousands of years. The difficulty of reconstructing the ethnic history of the region is greatly enhanced by the certainty that it has undergone

---

mitted to their action and that in common conversation it requiries a very nice ear to discriminate the intonated words. Although it appears to me, after repeated experiment on the speech of different Siamese, that in rapid speech the tones become so obscured as to allow of an apparent shifting of accent, it is proper to add that the Revd M. Grandjean, with whom I discussed the subject, does not recognize the existence of a phenomenon which is certainly inconsistent with the fundamental character of the language. The examination of the extent to which the Kambojan and Siamese phonologies have been influenced by Pali and the Indonesian phonology, can only be properly investigated by Kambojan and Siamese scholars and I hope M. Grandjean or some of his able brethren will be induced to direct their attention to it. Kambojan would be the most interesting subject.

many revolutions of greater or less extent, that ethnic movements have never ceased, that developments once continuous have been disconnected, numerous tribes having been broken and scattered, driven into new regions, absorbed or extirpated. We have only fragments and slight vestiges of developments that have successively prevailed in each ethnic district, while there must have been many that have left no recognisable trace. Of the two kinds of linguistic evidence, the structural and glossarial, the latter is most important for the illustration of the history or connections of separate tribes. The reason is obvious. The facts of the former are numerically almost infinitely small compared with the latter. All the possible varieties of structure are necessarily few, while from the great variety of elementary sounds and tones, but more especially from the possibility of combining every 1, 2, 3 or more of these with every 1, 2, 3 or more of the others, the possible varieties of words are far more than sufficient to give every human tribe a distinct vocabulary. And, in fact, we find that while similar ideologic traits extend over wide regions of the earth's surface and embrace a multitude of tribes, the vocabularies even of proximate tribes having the same linguistic structure, exhibit great differences, and have sometimes an exceedingly small proportion of words in common. I believe, therefore, that structure can lend but small help to ethnology, after it has once marked out a few great developments. It is chiefly useful as an adjunct to glossarial evidence, for although it cannot tell what is the specific ethnic relation of ideologically related languages, which are placed at the farthest geographical remove from each other, such as the Fin and Australian in the Old, and the Esquimaux and Chilian in the New World, it can tell us that if two indigenous languages have a widely different structure, they must necessarily be far separated ethnologically and that any glossarial resemblances they may possess must have comparatively little positive value for the investigation of the ethnic relations of the tribes that speak them.

It results from all the preceding considerations, that the developments and differences of languages belong essentially to Phonology, and that this science, so far from deserving to be only slightly noticed or even entirely overlooked, as it is in most of the notices which we receive of unwritten languages, and in too many elaborate grammars of cultivated and written ones, claims for itself the first and highest place in ethnic philology. In the Chinese and other crude phonetic languages we see nearly every possible ideologic element of speech. In the highest inflexional languages we see nothing more. The difference is mainly a phonetic one. In the former the intellect performs gigantic labours to reflect itself through uncombinable sounds. In the latter the lithe and harmonious phonology is a reflection, faint though it be, of the motion of the mind. As each successive idea takes a colour from the last, and seems to foreshadow and melt into the next, so each word not only burdens itself with its own individual meaning, but reflects what has gone before, and excites and directs the mind for the reception of what is to come.*

It may be advisable to add that it cannot be taken for granted that the modifications of the polytonic phonology observable in the Lau and Burman formations have been the result of an internal phonetic decay or development in these formations. It is, on the contrary, probable that the difference between the Chinese phonology and that of these most western members of the monosyllabic alliance, is in a great measure, if not entirely, owing to their having been long in contact with the harmonic formations of India and Indonesia. The Chinese-like tribes of Ultraindia appear to have intruded into an ancient harmonic formation that extended from the Himalayas to Tasmania, and it is more probable that their languages were partially influenced by the native ones than that, on their first emergence from the western highlands of China, they differed from the western Chinese languages as they now do. At the same time the slight advance towards a harmonic phonology which they exhibit illustrates the mode in which a full deliverance from the tonic bonds may eventually be accomplished, for I do not suppose that so great a change has been produced in any polytonic language by internal development alone, so long as it remains in contact with other polytonic languages. If the Burman stock was a tribe ejected from the Alpine polytonic province on the N. E. of Ultraindia, and cut off from all connection with its kindred Alpine tribes, the difference between the Burman phonology and the Chinese might have been affected by internal decay. But it cannot be assumed that it was so. Burman may be a fully polytonic formation akin to Chinese and partially modified by the influence of harmonic Turanian languages with which it came in contact. A searching comparative analysis can alone solve such questions.

Before proceeding to the Ultraindian and Indian formations, I shall offer a few additional remarks on the general history of language. The subject will be found more fully considered in connection with the Asianesian languages, and some of the special Aso-African formations more particularly bearing on the archaic ethnology of India, will be further noticed in the course of the present paper. The development of language may be viewed under two aspects, a purely theoretic or scientific, and a historical. By a combination of universal philology, based on a knowledge of the actual state and of the histories of all existing languages, with the abstract principles of ethnology based on a knowledge of human races and their mutual action, a science may be attained which shall be able to explain the successive developments and transformations by which one primary crude formation,—a mere phonetic reflection of material phenomena in the concrete,—generated all other linguistic formations. Such a science will illuminate the path of the enquirer into the character and history of every separate language and formation, but it will not enable us to reconstruct the entire linguistic history of the world any more than it will raise the veil from the future. The history of language, past and future, is the same as the history of races, and no science can reflect the actual course of human history. We may, to a very limited extent and in a very general manner, recall or anticipate the slow development of civilisation and the influence of great formations, but as no science can predict what new nations and languages may have arisen, what old ones become extinct and what distribution of races and tongues may exist, four thousand years hence, so no science can fill up the numberless blanks left by history and unfold a perfect map of the races and languages that divided the world amongst them four thousand years ago. Theoretic philology will explain the distinctive character of any given language, and its abstract relation to any other language, but it cannot explain the historical or ethnic relation. The latter can only be explained by history itself or by ethnology in its most comprehensive sense where history fails us. Ethnology is an attempt to recover lost history, and language is only one of the records which it uses. It is from confounding philology with ethnology that the German philologists have pushed their science "far beyond its legitimate bounds." Even a man of Bopp's sagacity has come to believe that, with a handful of pronouns and particles, he can attract all the languages of Asianesia into that Iranian formation which has been his life's study. Philology alone cannot explain the historical relation of Polynesian to Sanskrit, of Burmese to Chinese, or even of Welsh to English. The common linguistic traits of even the two last are but one element in their ethnic relationship. The linguistic differences form an equally important and much more complex element. But to form any approximation to the real connection of the two races, the entire ethnic (including the linguistic) affinities of each with other races must be first studied. The example is sufficiently illustrative of the fact that a striking philological affinity, even when corroborated by a strong physical one, is exceedingly deceptive, if exclusively relied on to explain the relation of two races in actual contact. Every ethnic province presents similar warnings, many of them much stronger, and the great, and as yet undetermined, antiquity of human formations, evinced by the prevalence of numerous widely separated races and languages, combined with the fact that in all eras a few formations have been diffusive while others have remained stagnant or become absorbed or extinct, should rather lead us to look in every province and language for the remains of a succession of formations, than to jump to the conclusion that a discovery of certain prominent affinities with foreign linguistic families is tantamount to a recovery of the history of the language and race. The only legitimate conclusion is that a certain linguistic formation has at some period become diffusive, reserving the question as to the older history of the languages in which it is found or of the other elements with which it is combined in them. Every such formation, however numerous the languages into which it enters, must have originally been confined to one language spoken by one tribe. The Indo-European formation can, with much probability, be referred to one small province in the S. E. of Asia, where it must at one period have characterised the single language of a single tribe. The nature of this formation, and its relation to the conterminous languages, prove that it is of comparatively recent and rapid expansion, and consequently of little comparative importance in the investigation of the ethnology of the world or of any one of that multitude of languages which are connected with other and older diffusions.

---

* The extract from the paper read before the Edin. R. S. ends here.

When the ethnologist begins his enquiry into the archaic history of the Old World with the Iranian formation, has traced it back to the epoch when it was a non-diffusive language of a single secluded tribe, the next question that occurs to him is what formations prevailed at this epoch, and does the Iranian mother speech connect itself with any of them? Along the whole course of the Iranian movements from Ireland on one side to India on the other, he had remarked remnants of older formations, in general almost purely glossarial, although very abundant, but in some cases, as in the Celtic, speaking to a fundamentally different phonology, and in others, as the Iberian, the Fin, the Turkish and the Dravirian, retaining all the characters of independent formations. The native seat of the Iranians being nearest the Turkish formation he naturally turns his attention to it first, and he finds in it a formation which has obviously a close affinity to that which constitutes the main element in the basis of the Iranian itself. His analysis of the latter reveals to him a stage of its existence when its postflexions were post-formatives, and the Turkish presents him with a formation that remains in this stage. Following the Turkish formation through the wide range of its affinities he finds that it is only one of numerous formations, variously related, that must have successively spread, from different centres, over the Aso-European continent and beyond it. In the Turkish he distinguishes two leading traits which are not Iranian, a rigidly inverse collocation and a culture of vocalic harmony, extending to euphonic permutations of the vowels of post-fixes. Both traits connect the Turkish with all the northern formations of the Old World. But in these formations both the phonolygy and ideology are more complex, and traits appear which connect them with the Celtic, the Iberian, the Caucasian and the American languages. The phonology in particular is not merely agglomerative as in the Turkish and Iranian, and euphonic and plastic as in Turkish much more than in Iranian, but it becomes agglutinative and amalgamative in various degrees. In the American this phonetic cohesion is carried to an extraordinary degree. It is also strong in the Iberian. In the Ugrian and the N. E. Asiatic languages it is much less powerful but still very considerable when compared with the Mid-Asian formations, the Samoiede, the Mongol and the Turkish, the two last being the least cohesive of all. In the Celtic, the N. African, and the Caucasian formations, the same agglutinative or amalgamative tendency exists with a great deficiency in agglomerative power even when compared with the Scythic formations and which greatly distinguishes them from the Iberian and American. The position and wide spread of the American phonology with its relations to the N. Asiatic and Iberian and to the other agglutinate but curt formations of the west, carries back to a very remote era the first development of a highly agglomerative and cohesive phonology. From the earliest diffusion of formations of this kind in Asia, Europe and Africa, to the epoch when the more crude Scythic formations began to predominate in Asia and extinguish or modify the older ones, a great lapse of time must have happened. The N.E. Asian (including the Japanese) the Ugrian and the Mid-Asian or Scythic appear as successive impoverishments of the elaborate American phonologies and idioms. They stand between the Chinese and American formations and there is a wide interval between them and each of these extremes, but greater on the Chinese side, even with the gradations into Tibetan and Burman, than on the American side. But for the western remnants of cohesive phonologies and of idioms allied to the American, it might have been concluded that there was a real historical chain from Chinese to American through the mid, north and east Asiatic languages, and this illustrates the fallacy of building ethnic theories upon partial linguistic affinities alone. In this case also, as in that of the Welsh and English, physical resemblance and geographical proximity countenance the hypothesis of a direct historical connection between the Chinese and the American languages. The Japanese, Northern Chinese and the principal North American races, do in fact so strongly resemble each other and differ so considerably from the Ugro-Scythic and allied Asiatic races and from the Esquimaux, that there can hardly be a doubt that they are descended from the same E. Asiatic stock. But even if this is admitted, the western affinities of the Japanese and American languages would prove that there was no direct connection between the latter and the Chinese. The Japanese people may be Chinese but the language is Fin much more than it is Chinese. The probability of the E. Asiatic stock of the predominant American race having moved into the Tungusian province, and thence into Japan and Northern China, without obliterating or even modifying the native language of the latter region, complicates the whole subject of eastern ethnology in no ordinary degree. If affinities of race claim a purely eastern basis for the ethnic relation between the Chinese and Americans, while the western linguistic affinities of the latter and their extension deep into the outlying African province, beyond the northern Semitic barrier, make it certain that formations closely allied to the American were at one time predominant and diffusive in the western extremity of the Old World, the affinities of the existing North Asian formations to the Iberian and African and to the American render it also certain that formations akin to the latter must have spread over northern and probably middle Asia from west to east, before the Ugrian and Scythic formations became dominant and diffusive. On the whole, no other conclusion can be drawn from a comparison of the African, the pre-Iranian European and the N. Asiatic languages with the American, than that, before the latter spread into the New World, formations akin to it predominated throughout the Old, save in the secluded tracts protected by the great southern mountain systems extending from Caucasus to Shan Garjan, and that the present mid and north Asiatic formations are modifications of the ancient ones, caused, in all probability, by the perennial influence of the crude formations of civilised southern races. We have so little exact knowledge of the archaic history of Asia, that we cannot affirm that such a formation as Tibetan may not have resulted from contact between a language like Turkish or Mongolian and a monosyllabic one like Burman or Chinese, nor can we conjecture how many formations intermediate between Burman and American may have been developed and diffused, from the time of the first contact of the highly agglutinative phonologies with the monotonic, until the era when the latest and most modified of the diffusive Mid-Asian formations of the former became the basis of the Iranian and gave rise to a new and powerful development. That the American era of Asiatic language is separated from the Iranian by a wide interval, during which several civilisations and diffusive formations prevailed in Upper Asia, some of them spreading into Africa, India and Asianesia, is a conclusion that does not rest upon a mere comparison of phonologies and ideologies. There is no branch of ethnological evidence that does not confirm it. So far as the progress of arts and customs can be traced by a direct comparison of races and by glossarial data, it appears to have been effected by a succession of great diffusions. Comparisons of particular classes of words connected with arts that only arise after the lower stages of barbaric ethnology have been left behind, place it beyond doubt that civilisations arose and were diffused before the eras of the historical races and formations.

Having followed out the affinities of the Scythic element of the Iranian formation on the Iberian and American sides, the western ethnologist would be brought round to the other main element by tracing the modification which the Archaic agglutinative phonology undergoes in the N. African, Celtic and Caucasian formations. In them the power of cohesion remains, but that of agglomeration disappears. The phonology from having a centrifugal or expansive tendency becomes centripetal or contractile. He has in fact touched a distinct linguistic formation, in itself as strongly marked and peculiar as the Ugro-American or the polytonic, but which is here modified and disguised by the influence of the former. When he passes beyond the marches and their hybrid formations, he finds himself in the Semitic province and in the midst of a formation which stands alone in many respects but which is not entirely new, for the Celtic and even some of the more purely Iranian families had shewn him glimpses of it. The distinctive characteristics of this formation are two, one being much more essential than the other. This is the power of expressing certain generic modifications of meaning by an internal flexion of the root itself, a power which can only co-exist with a highly abstract intellect. The basis of such a formation is metaphysical. For the purposes of speech, ideas have become abstract. Now as the Semitic formation marches with one which is highly agglutinative and incorporative, and it is impossible that any language could have originated with an abstract basis, it is probable that this formation was incorporative and elliptic, like the adjacent Caucasian, before it became inflexional. If so, the internal flexions may be resolveable into infixed words that were gradually abraded till they lost their distinctive forms and left no other sign of their presence save their effect on the vowel of the root. As soon as they lost their identity, they became mere flexions, and the flexional habit thus educed might be modified and extended, so that some of the existing flexions may be actually flexional in origin. Be this as it may, the Semitic presents itself, from its first appearance, as a purely and essentially flexional, and hence, as a highly abstract, formation, furnishing, in this respect, a complete contrast not only to the monotonic languages, but to the Scythic basis of the Iranian. The other distinctive character of the formation is a much less essential one, for it is a mere matter of collocation. It consists in the structure being generally direct instead of inversive, and in the formatives which it possesses in common with all the Ibero-American and derivative formations being prefixed instead of postfixed.

The abstract, flexional, preformative and non-harmonic formation furnishes all the main non-Scythic elements of the Iranian. No formation of a similar Scythico-Semitic character to the latter is found in any other part of the world, and we are justified in saying that such a formation could not have arisen save in Irania. In an advanced stage of continental ethnology a new formation can only be originated by the contact of old formations. A formation like the Iranian could not have arisen in Africa, because the prevailing African languages are at once too harmonic and too Semitic. Africa in fact presents examples of new formations produced by the blending of Semiticism and Africanism, and they differ greatly from Iranianism. If the eastern limit of the Semitic province had bordered on that of the Dravirians, a formation akin to the Iranian would probably have been the result of long contact. But the actual position of the Semitic race rendered Irania the necessary birth place of the Indo-European formation. The basis was a Scythic formation, far indeed from being identical with any existing one, but closely allied to the Tartar not only in phonology and structure but in many roots of an essential kind, including pronouns. As the race is much more Semitic than Scythic and the language has a strong Semitic element, it is probable that the new formation was a consequence of the advance of a Semitic tribe into a Scythic country. The Osmanli shew that a Scythic race may lose its physical character while it retains its language, but in the Iranian formation the physical evidence of Semitic stock is aided by the Semitic linguistic ingredient. It may be asked, if the Iranian formation is Scythico-Semitic, why were similar formations not produced at earlier periods around the borders of the Semitic province? I have no doubt that various Semiticised formations were previously originated on all sides of the primative Semitic location. Some of these may have been absorbed or obliterated in the progress of the pure Semitic race and formation, or in that of the Scythians, or that of the Iranians. The immediate stock of the Indo-European languages may have been only one of several allied languages which were absorbed by that which ultimately became predominant and expansive. Or there may have been a series of mixtures, the last contact of Semiticism with the already modified Scythico-Semitic formation producing the Iranian. The Iranian family itself probably offers several examples of secondary formations, produced by the action of the earlier languages of the Iranian type on each other and by the influence on them of contiguous Semitic, Semiticised, Scythic and pre-Celtic European formations. Where the Celtic, the Skipetarian and the Armenian differ from the Sanskrit, or, reversing the point of view, where Sanskrit differs from them, the differences instruct the ethnologist to search in the conterminous and included formations of the Iranian province for their primary causes and for a clue to the history which they involve. Nor are the most closely related branches of the European side of the tree without strong marks of their having received grafts before and after they began to overspread the western quarter of the globe.

No doctrine can be more fallacious than the seemingly philosophic one of ignoring all formations and stages of formation that have not maintained their existence to our own time. The true doctrine rather is that nothing remains in any considerable province but fragments and detached links of the series of formations, and the numerous individual languages, that have existed in it. There is no part of the world where great and fatal collisions of tribes are more likely to have repeatedly occurred, than along the shifting line of demarcation between the two great races who divided Western Asia between them. But there are other languages extant besides the Iranian in which a Semitic element is recognizable. The north and middle African languages are greatly Semiticised and the Dravirian languages have a Semitic tinge, although it probably belongs in great measure to a very remote era, anterior to the rise of the predominant Semitic formation. The Georgian and Caucasian languages are partially Semitic and it is far from being improbable that they were produced by the contact of an archaic Mid-Asian formation with a Semitic one. On the West partially Semiticised languages may have existed in S. E. Europe before the Iranian race spread over it. But the era of Semitic civilisation and diffusion, although ancient compared with that of the derivative or consequential Indo-European, is itself recent in relation to the prior agglutinative formations that spread in successive waves over the greater portion of the world, including Africa and America. It would be vain therefore to look for deep traces of Semitic influence much beyond the Semitic centre. It is in fact through the medium of Indo-European that the Semitic development has attained its greatest range of transmitted influence, a sufficient proof that its place in the successive great formations of the world is a recent one.

The mode in which languages affect each other is one of the most essential, and has hitherto remained one of the most obscure, elements of ethnology. Here also the influence of an exclusive study of the Indo-European formation has been pernicious. Humboldt and Bunsen have rudely shaken many of the old notions, and the rapid strides which German philologists are now making in all directions beyond the Iranian boundary, will soon conduct them to views which will render even some of Bunsen's doctrines of 1847 antiquated.* The more that independent starting points in the investigation of language are multiplied, the sooner will the truth be evolved. Rask took the Scythic point of view with splendid results. Bunsen made Egypt his centre of observation, and threw a new light on the archaic languages of S. E. Asia and on the Iranian development itself. Charles Meyer is making through the Celtic a wide breach in the Iranian wall of inclusion. Hodgson is looking over India from his Himalayan post and will be led on by his researches till the ethnology of all Asia is involved in their results. Such of the current views respecting the mutual action of languages as originated in a narrow field of observation and have been accepted on the faith of the great names with which they are associated, cannot long be maintained as fixed canons when they are thus fully confronted with a succession of distinct linguistic provinces in all parts of the world. There is probably no other region which offers so many facilities for the investigation of this subject as the Indo-Pacific islands, with their many hundreds of separate languages, all more or less exposed to the influence of those of the more civilised maritime traders and colonists. If Humboldt had been here he would not only long ago have unravelled their complicated affinities, but would have educed from them a complete science of linguistic transmutation and re-formation, and I think that he would have considerably modified some of Bunsen's positions. I may assume that my readers are familiar with the admirable ethnological discourse published in the Reports for 1847 of the British Association for the Advancement of Science. To most of the views of the author I most fully assent. The more deeply the comparative philology of any considerable region is studied, the more fully will their general soundness be

---

* There is one deep rooted source of error in Bunsen's ethnic speculations, as in those of many other German philosophers, the Schegels amongst them. It is assumed that the ethnology of the ancient Hebrews, as preserved in their sacred books, is a full reflection of that of the world. I have in another place, protested against this resumption in ethnology of the system that has impeded the progress of every branch of knowledge in succession, from astronomy to geology, that of endeavouring to bind down the human mind to the science of the ancient Hebrews. There has been no divine revelation of ethnology any more than of geology, zoology or any other purely mundane science.

We might as justly refuse to recognize the existence of plants, animals, and planets that are not mentioned in the Bible, as base our ethnology on that of a people who were perhaps the least ethnologic of all great civilised nations that have existed. It is obvious that any ethnic science that does not embrace every tribe and language in the world must be needlessly imperfect, and that an exclusion of large sections of the human race must render it grossly so. Now it is certain that the Hebrews were ignorant of the very existence not only of the extensive outlying human provinces of America and Asianesia, but of the great mass of the tribes of the Old World. They do not appear to have cultivated a knowledge of any non-Semitic language, and consequently their ethnic notions respecting even the adjacent non-Semitic tribes must have been very obscure and erroneous. It may be doubted whether their knowledge of the Africans extended beyond the Egyptians and their southern Nilotic neighbours, the Ethiopians. The European nations were unknown to them save through some vague impressions respecting the sea board tribes of the S. and W. Coasts received from the reticinent Phenicians. Their knowledge of the numerous nations of northern, middle and eastern Asia was equally partial and obscure. They do not appear to have had a suspicion of the existence of the great civilised peoples of the East, the Arians and the Chinese, and they were as profoundly ignorant of the Dravirians as they were of the Germans and the ancient British. Nothing can more conclusively shew the extremely narrow and isolated character of their ethnology and their rigid seclusion from time immemorial in the Semitic civilisation, than the fact that they had entirely lost, and had been unable by their observations to recover, the idea of barbarism. In this respect their ethnology is far below that not only of Herodotus and Manu, but of the other Semitic nations, such as the Arabs, the Phenicians and, in all probability, the Babylonians, at least in their more civilised and commercial era. It is therefore surprising to see a writer like Bunsen founding his ethnology on that of Moses which can only be correct as a partial picture of the races of S. E. Asia and N. E. Africa as known to the Hebrews.

recognized. I have already noted some points in which they appear to me to require qualification (Journ. Ind. Arch. Vol. III p. 641 &c.) and I have reserved for the conclusion of this series of papers a distinct consideration of the light which Bunsen's theory, as modified by Asianesian ethnology, throws on the history of the successive ethnic and linguistic formations of the world. At present it may be sufficient to say that, to my thinking, he allows far too little influence to the reaction of phonology on ideology. He views the development of language too much as an abstract intellectual process. Hence he sought, without success, to bridge over the gulf between the tonic and the harmonic formations. He insisted rightly but too exclusively that the difference was that between unorganic and organic words. He seems to have felt also that the beginning of the change must be a purely phonetic one and the perusal of one passage which I have copied below * leaves the impression on my mind that if he had not been misled by Ramusat and Humboldt into the belief that in Chinese the accent co-existed with the tones, he would have recognized in the decay of the latter and the development of the former, the true link between the unorganic and the organic formations. On this subject I may remind my readers that I consider the peculiar character of the Chinese family to depend essentially, not on its ideology, but on its crude and polytonic phonolgy and consequent want of the accent, that the decay and ultimate loss of the tones, with the concurrent necessity of enlarging the phonetic basis by a more regular use of double words and particles, leads to development of the accent or to a harmonic phonology, and this phonology, in the almost boundless range of its own development and modification and through the action and reaction between it and the older polytonic phonolo-

---

* "Every really primitive language (if there are more than one) must therefore have begun, as we find that the Chinese and all monosyllabic languages really did begin.

"Perhaps we may also find the necessary steps of development, from such a beginning to the perfection of formative languages. Whatever they are, there is above all one step which forms the paramount distinction between the languages of mankind; that in which all the component parts of a sentence are themselves signs of an undeveloped sentence, and incapable of modification according to their specific meaning in a given sentence, and that in which the form of words has been made subservient to this sense.

"This difference is that between languages with unorganic and with organic words. Within the first unorganic structure, and therefore in the rigidly monosyllabic state, we can again establish that there must be one considerable and necessary step, which is that from simple roots or syllables to compound ones. The simplest roots must consist either of a vowel alone (pure syllables in the strictest sense) or of a consonant, having its inherent vowel either before or after it. Syllables, beginning and ending with a vowel, and having besides a consonant between them, are already to be suspected of contraction, unless the consonant be a servile one, as the liquids and the sibilating sounds generally are. Indeed this difference between the degree of substantiality of the consonants is a powerful element for the development of words into an organic structure. Monosyllables with two substantial consonants are the furthest extreme to which monosyllabic languages can arrive. This whole reasoning proceeds upon the fundamental assumption, that in languages of this nature (having only full roots, or sentencegies, produces all other formations known or possible, be they agglomerative, agglutinative, or incorporative, formative or inflexional. The tones are, in reality, incompatible with the accent because they involve it. Every tone is a strong and *articulated* accent raised into a distinct phonetic element standing on the same footing as the unaccented vowels of other formations. The accent can only exist in tonic phonologies as an element of syllabic isolation or repulsion. When the vowels are reduced to simple unaccented elements, the accent starts into distinct life as a purely rhythmical power and becomes the parent of harmonic glossarial combinations. Bunsen's views respecting the mutual action of languages also appear to be somewhat two ideologic and abstract, although in this he is countenanced by those of the leading *Iranian* philologists. I have been led to believe that, so far from there being any theoretical limit to this action, the kinds and degrees of mixture and transformation are necessarily as varied as the conditions under which the contact of races and languages takes place, and these conditions are infinite in their variety and complexity. Where is the proof that pronouns cannot be borrowed by one language or formation from another or that two or more pronominal systems of distinct origin may not be successively blended? The facts seem to be all the other way (Journ. Ind.

---

forming words) there is a rational correspondence between the unity of perception and of sounds. Two equally strong consonants again of the same organ of speech (as two labials, two linguals, and so on), may come under the head of a simple increase and slight modification of the one impression. But syllables with two mute consonants of two different organic classes pre-suppose a union of two, which requires originally two syllables.

"Other varieties can exist within this dark and almost unexplored sphere, by different systems of position and accent; but the line of progress will always lie in the approach to the breaking up of the character of substantial fulness and isolation of the single words.

"The only preparation which, after a literature of four thousand years, the Chinese presents for such a change, is the use of some of its unchangeable roots as signs of grammatical relations.

"A nation which formed itself into existence from such a state of the language, could as easily make that great step, which leads to affixes and then to inflexions, as the mummified Chinese is incapable and unwilling to do it. It is the feeling of the absolute independence and isolating substantiality of each word in a sentence, which makes him contemplate such a change as a decided decay and barbarism. He expresses daylight by two words signifying exactly in the same order day light, but he cannot condescend to subordinate the second to the first, by saying (with one accent) day-light.

"The tendency to compound syllables is also in itself a tendency to such a change. The distinction between words and syllables, by the formation of polysyllabic words, is the declaration of the entrance into the second great stage, the organic one of the words.

"Every composition produces or prepares decomposition: it pre-supposes a third thing, uniting two distinct units of perception and thought.

"One of the things thus united will be in process of time subordinated to the other, as the determinative or accessory. A word of more than one syllable is the expression of a compound notion: it constitutes the expression of a higher unit by the subordination of one simple notion under another simple one. The former loses the accent; for without unity of accent there is no unity of the word in speech. The Chinese has no real compound words; for in apparent compositions, like day-light, horse-man, each component word as we have already observed, preserves its own accent, and there is a pause between them." p. 298.

Arch. vol. V. p. 582). Where is the proof that the grammar of a language may not be modified more extensively than its vocabulary? A displacement of a vocabulary by a foreign one is tantamount to an extinction of the native language. But the adoption of the structure of a foreign tongue does not necessarily imply an abandonment of the native vocabulary. It is probable that intruding grammars have been more often and more fully adopted than intruding glossaries. The barbarous or inferior native tribes acquire the idiom of a civilised and dominant race of intruders, and this idiom gradually supplants their own, but the old vocabularies are often largely preserved by them and adopted by the intrusive race. Thus it has been in the progress of the great formations of Asianesia. The Papuans of the Viti Archipelago have adopted the idiom of the intrusive Polynesians, but they have retained their native vocabularies to a great extent. So it must have been when the Iranian formation was diffused abroad. The numerous vocabularies of the Indo-European nations cannot have been derived from one mother tongue. The prevailing idiom and a portion of the glossaries were derived from one ultimate source, that of the diffusive race itself, but the mass of the vocabularies must be older in Europe than the Iranian formation. The Semitic idiom has been largely blended with the native ones in north Africa but the ancient vocabularies remain. Whether both the new idiom and glossary shall replace the old, or the new grammar alone or the new vocabulary alone shall mainly become that of the land, must depend on the conditions of contact and mixture in each particular case, and these conditions involve not only the mode in which contact takes place and the relative weight given to each language by numbers, character, religion, civilisation and other equally obvious ingredients in ethnic influence, but also the nature of the two linguistic formations. External ethnic advantages being equal, a language like the Chinese must ultimately give way to one like the Malay. The cases in which a conquering race is so inferior in numbers, in linguistic tenacity or in civilisation that it cannot impose its language on the conquered nation, may be left out of view. The most frequent event, in the progress of great formations, must have been that of the advancing race entering a region where numerous native languages are spoken and no native tribe is so superior to the others in civilisation as to have made its tongue a *lingua franca*. In such a case the language of the diffusive and dominant race inevitably becomes a *lingua franca* and in time each native tribe that is not swept away acquires it in addition to its vernacular. If the dominant race rapidly augments from without, the native tribes and languages may become extinct. But if an amalgamation of the two races takes place, and any of the native tribes are so large as to retain their own tongues, linguistic fusions may arise. One idiom may give way to the other, or, if both continue to be current for several generations, a modified idiom may be produced. The native population with sooner acquire the new idiom than the new vocabulary, and so with the intruding population. Hence, long after displacement or fusion has produced an assimilation of idiom throughout a large province, the glossaries may remain discordant. A complete glossarial assimilation must always be the last step in the fusion of languages. Very few instances can be adduced where it has taken place. At present there is probably no country in which different tribes have acquired a common idiom without retaining traces of the original diversity of stock in the glossarial peculiarities of different provinces. In general wherever a difference in glossary co-exists with a similarity of idiom, there is evidence that tribes laid aside their native grammar but retained their native vocabularies. The cases in which the vocabularies have diverged furnish the exceptions not the rule, in anciently civilised regions like the Aso-European continent. The propagation of vocabularies from a single source, by mere internal decay and growth (excluding the slow phonetic and ideologic changes in words to which language is every where subject) belongs chiefly to the more barbarous ethnic eras of every province. Such a phenomenon may be of frequent occurrence in some parts of Africa, S. E. Asia, Asianesia and America, but it must be rare in that region of the Old World which had been repeatedly traversed by dominant archaic civilisations and linguistic formations before the Egypto-Semitic development originated the latest civilisation, born of the older, which is still in a course of diffusion. But in the ever changing conditions of linguistic development and progress, instances must occur of a greater persistance of the form than of the substance of a language. The phonology and ideology may survive a repeated displacement of words of all classes. There may even be a succession of vocabularies while the form remains little changed. Where a race is dominant and also from the first numerous, or its numbers are constantly recruited and its language and nationality maintained by accessions from the mother country, it will, in general, impose its idiom on the conquered tribes, the glossaries being retained in a greater or less degree and for longer or shorter periods, according to circumstances.* Where its influence arises from power or civilisation and it is comparatively small in numbers and not annually augmented, it will in general affect the native idioms and phonologies. The Great Polynesian race of Marsden and Humboldt imposed its idiom and phonology on the eastern islands and the form which was thus given to the prevalent languages of Asianesia has survived a perennial stream of glossarial change. The latest great formation of the islands, the Arian, deluged the vocabulary of the most civilised nation with new words, but it did not affect the idiom because it belonged to a race influential from civilisation not from numbers. But one of the intermediate formations which spread into the islands from Ultraindia, produced a real fusion of languages. It not only bestowed new words but a new race on the islands, and the consequence was that true hybrid idioms were produced. The Malayu, for example, may be considered as a cross between a native formation like the Malagasi and an intrusive one like the Siamese. The Malayu formation itself, in its progress beyond the original Malayan province, exhibits, at the present stage of its diffusion, examples of numerous degrees of influence, each operating under a considerable diversity of conditions. Thus in one district it has displaced the native language because Malays have settled down as conquerors or colonists, while it has produced the same effect in another which they merely frequent as traders and propagandists of religion. In some cases Malay traders have for the first time, given a *lingua franca* to a river basin or an island and thus produced a revolution in the mutual relations of the native tribes. In such cases the entire group of languages may simultaneously and completely perish. In other provinces the Malays have bestowed much of their idiom while the native vocabularies are largely preserved. Sometimes the native idiom merely becomes partially Malayanised. There is no case in which the ancient idiom fully maintains its ground while the glossary has become Malayan, because such a conversion must be the effect of a long protracted and comparatively weak influence, and the Malay formation is a very modern diffusive one. Its affinities with most of the languages of the Indian Archipelago and with all those of Micronesia, Polynesia and further Papuanesia are attributable to a succession of older diffusive formations, Malay itself being only one of many hundreds of the resulting languages. In most of the islands of Asianesia in which there is a diversity of vocabularies combined with an agreement in idiom, the latter may be traced to the influence of one intrusive civilised race, while the former are the remains of a succession of glossarial formations that have been received from abroad, sometimes accompanied by ideologic formations that have been, one after another, displaced, modified or fused with others. The process can be well studied in this western portion of Asianesia, in which the latest of the dominant secondary or consequential formations, is still in progress, while a succession of older formations, reaching back to the earliest Indian one, can be clearly made out in large portions of the region. Instances both of the complete loss and of the mere disorganisation and decay of a native idiom, from the presence of a foreign linguistic element, are common in Asianesia, because the insular tribes are as lax in their nationality as the Syro-Arabians and Chinese are tenacious. They are remarkably impressible and imitative. The recent history of the Polynesians well exemplifies this trait in the character of the race. The author of a Maorian grammar has remarked that some dialects are already losing native forms under the influence of English. The loss in West Indonesia of the complex formative combinations and refined idioms preserved in the Philipines, is attributable to the influence of the crude Ultraindian formations. Some of the Western languages are idiomatically so hybrid that it is hardly possible to decide which of the constituent formations should be considered as the basis, and the attempt to solve the problem has led me to the conviction that, historically considered, languages are mere creatures of circumstance, and capable of undergoing successive metamorphoses as complete as letters (i. e. sounds) themselves, every one of which, as comparative philologists know, graduates, in different directions, into every other. Hence it is that languages cannot be classed like animals, vegetables or minerals. They must be described not systematically but genealogically. When we know the genealogy of a language we know it ethnically, and the investigation of one branch of its affinities or linguistic studies alone, however enlarged, will never give this knowledge. If the history of a single family could be traced back to its first origin, it would be found to have points of contact with numerous others, indeed, in a large sense, with all others. So it is with tribes and languages. The points of contact with other tribes and languages cannot be known well till they are known genealogically.

---

* The Roman conquerors of Gaul Romanised the language of the land. The Tartar conquerors of China have never affected either the idiom or the vocabularies of a native race that surpassed them in civilisation as much as it out numbered them.

An accurate observation, in different parts of the world, of every instance in which two languages are spoken by the same people, or in which one language is gradually supplanting another, will lead to much more satisfactory results than the most profound speculation respecting transmutations of language can furnish. Ethnologists need not confine their observations to cases in which different formations are in contact. Valuable ethnic principles may be deduced from the prevalence in one country of several dialects of the same language. Great Britain itself, like many other outlying points of large ethnic provinces, abounds in most instructive phenomena, which have not yet yielded half their lesson to ethnology. Scotland and the north of England afford several examples of the persistance of ancient vocabularies long after a more or less complete assimilation of idiom, although traces of pre-Anglican idioms are not wanting, for they may be detected in the language of every Scotchman who has not learned English in England. What is commonly called Scotch, the Scotch of those educated Scotchmen who have not yet become ashamed of their mother tongue, the Scotch of the Waverly Novels, of Burns and other modern makers of songs, is in reality an example of a mixed language. It is not the old Norse-Scotch but Anglo-Scotch or rather a Scotch dialect of English. Had the part which England has been destined to play in the history of the world been otherwise shaped, this mixed language might, at an earlier and less Anglian stage of its formation, have become a permanent idiom, but in a few generations it must become obsolete as a spoken dialect, although it may long continue to be cultivated by literary men, and the songs of Burns, with a few others, will never cease to be sung. If they had been less English their chance of perpetuation would have been smaller. India is another fine field for the observation of the progress and blending of languages. It is well known that the contact of the Arian and the older formations has given rise to one of the great debateable points of current philology. I do not venture to offer an opinion on a subject which is still a source of discord to eminent Indian linguists, but whatever may be the exact history of the formation of the Guzerati-Bengali class of languages, it is obvious that they contain some pre-Arian ingredients both in glossary and idiom, and I am not without a hope that something may be found in the following pages which, in the further discussion of the question, may prove suggestive even to Indian ethnologists and philologists, although I have gone no further into the Indian languages than appeared to be absolutely necessary for my insular enquiries, and I have consequently avoided the consideration of the Arian element as much as possible. It connects itself, in its proper Indian era, with the history rather than the ethnology of Asianesia.

Dr Stevenson is at present engaged in a more full comparison of the modern North Indian languages with the Sanskrit on the one side and the Dravirian on the other. This reason alone would induce me to pass over this essential portion of the present investigation until his paper, now in the course of publication, is completed. It is greatly to be desired that he or some other competent Indian philologist would place the comparison on a somewhat wider basis; so as to secure decisive or ultimate results for Indo-Australian ethnology. The first element in the enquiry is the philological relation of Dravirian to Sanskrit and its allies. A large comparison would shew a considerable portion of common roots and the search for those roots in the Scythic, Caucasian, Semitic, and African languages would throw light on the ethnic relationship between Dravirian and the mother tongue of the Indo-Germanic formation. The most important comparison, however, would be one having for its object the ascertainment of the non-Sanskritic roots common to Dravirian with the northern and western languages of India, with the Pushtu, Béluchi, Brahui and other languages between Persia and the Indus, with the Caucasian and Armenian, with the Scythic and lastly with the languages of Persia themselves. Of course each root that was found to ramify widely amongst these vocabularies would have to be pursued into the other vocabularies of Asia and those of Europe, Africa and Asianesia, before the full ethnic bearing of the affinities indicated could be ascertained, because from the archaic Draviro-Australian era, when West Asiatic words first began to pass through India to Indianesia until the period when Sanskrit vocables were first thrown into the current that has always set in that direction, a succession of linguistic formations or sub-formations must have carried words across the Indus and produced new affinities between the Dravirian vocabularies and others to the westward of that river. There is still another very important subject awaiting research. Whatever may be the geneology of the Indo-Germanic formation it must undoubtedly have been very ancient at the period it began to expand eastward and westward. Sanskrit itself is not the parent but sister of the other ancient members of the family, and the great distance between Sanskrit and all the non-Iranian languages of western Asia makes it evident that the formation must have existed as a distinct one from the Semitic, Scythic and Tibetan long before the Asian race occupied N. W. India, while it is also certain that the Semitic variety of the same race, whether it be or be not the parent of the Iranian, must have been located in Western Asia from a still more remote period. The extreme antiquity of the Semitico-Iranian race in this province being established by its strongly distinctive physical characters when compared with the purer African, Scythic and Dravirian, by the double evidence of the Semitic and Indo-Germanic linguistic formations, by the absence of this race and these formations in all other parts of the world, save those in which they are intrusive, and by their immemorial occupation of the impregnable mountain homes of the Caucasians and the range to the eastward as far as the Hindu Kush, the question necessarily arises, could such a race have remained for some thousands of years interposed between Africa and India without exercising any influence on the races and languages of these regions? It may be considered as established by a concurrence of physical, linguistic, artistic and historical evidence that this race became predominant in the basis of the Nile, at least from four to five chiliads before the Christian era. It is not probable that the Arians became predominant in the basis of the Ganges more than 2,000 years B. C. But it is equally improbable that a race which gave civilisation and a ruling caste to Egypt 2,000 to 3,000 years previously did not begin to affect the ethnology of India until this period. The preservation by such a race, during so long a period, of a rigid seclusion would be an ethnic anomaly. It is certain that ethnic relations must always have existed between the Iranian race and the tribes to the eastward of it, and the time is now come when ethnology may be called upon to answer the question whether these relations involved the extension of an Iranian physical or linguistic element into India anterior to the proper Arian era. Was the Brahminical or Sanskrit-speaking tribe which ultimately invaded and conquered N. W. India not preceded by other less civilised and less influential tribes of the same stock? Did the Iranian area not expand gradually to the Indus in ages anterior to the rise of the Brahminic civilisation, wherever its original location was? Were the eastern Iranian tribes not absorbed by the nation which ultimately predominated and spread its conquests into the Gangetic valley? Do the languages and races of India, Ultraindia and Asianesia preserve any evidence of a reception of Indo-Germanic or Semitico-Iranian elements prior to, and distinct from the special Arian or Brahminic? The progress of ethnology authorises these questions and demands positive replies, and I have no doubt that, within a few years, they will be given from various quarters. The first province for which a reply ought to be received is the Dravirian or Indian.[*]

---

[*] It is obvious that the geneology of no formation, nation or language will ever be fully traced up to its ultimate sources. Each will present a standing problem for ethnic research and ingenuity to the end of time. All that ethnology can accomplish is to ascertain such of the great formations as have left clear traces of their existence, and to detect their presence in individual languages. With few exceptions, every language extant must be the result of a series of changes produced by a succession of predominant formations. Each ethnic province, save some of the most secluded, must have undergone repeated revolutions, sometimes in race more than in language, sometimes in language more than in race. Ethnology has as yet advanced so little beyond the historical era in any important district, that, in illustration of my meaning, I shall take a supposititious case suggested by geographical and ethnic position. The valley of the Euphrates may have been first occupied by Negroes. The race, civilisation and language may then have been entirely extirpated by an Iranian formation from the eastward. The Iranians, after making certain advances in civilisation, may have been gradually dislodged by Semitic mountaineers from the head of the basin, who acquired the arts and civilisation of the Iranians, but retained their own language. Scythic tribes may next have moved as conquerors into the basin, succeeded to its ancient civilisation and acquired the prevalent Semitic language or produced a modified Scythico-Semitic one. Iranians may have again subjugated the valley, and this time modified the language. Lastly, the Semitic race, having now spread far to the westward and southward, may have advanced from the Arabian peninsula and produced a new revolution. The Nile, the Indus, the Ganges, the Irawaddi, the Mekong, the Yang-tse-kiang and the Yellow River may have had similar histories, although beyond Ultraindia the revolutions in race may have been less striking. Nothing can be more certain than that the linguistic formation of a province may survive repeated and total changes of race, and that, on the other hand, the native race may retain its predominance physically, though not always morally or politically, throughout a succession of linguistic revolutions.

CERAM LAUT ISLES.*

THE cluster of islets lying off the south-east extremity of the large island of Seran as it is called by the natives, or Ceram as it is laid down in the maps, are known by this appellation. They are situated in latitude 3° 55' South, and in the 133rd degree of East longitude, and form one of the most remote trading stations to the eastward from which the produce of the Archipelago is conveyed in native vessels to this port. The names of the several islets which compose the group are Seranreh, Gesir, Kaliwaroo, Gorong, Manokoo, and Malomgee. Of these the two largest are Gorong and Manokoo, and are the only ones of the group which exhibit any appearance of fertility: they are represented to be hilly and covered with wood, except where cleared for the purposes of cultivation; which however seems confined to the little rice which is grown on them. They produce fruit trees in considerable abundance, and among them the durian and mangoosteen, as also the wild nutmeg, the cocoanut and sago palm, the latter supplying to the natives the chief article of subsistence. The other islands are merely barren patches of land, from a half to three quarters of a mile in length and breadth, and able to rear only a few goats and poultry, most of the necessaries of life being supplied to the inhabitants from Ceram, from which they are distant only a few hours' sail. There is a tradition among the natives of these islands that a French vessel having been wrecked in their neighbourhood, and the Captain and crew, besides several soldiers who were on board, having escaped and sought their protection, were hospitably received by the islanders; that the commander of the ship married the chief's daughter, and that the whole of his companions, following his example, intermarried with the women of the islands, several of which are now almost entirely occupied by their descendants, the personal appearance of many of whom, it is said, does not at all discredit the tale. This occurrence, they say, took place about twenty generations ago, but must of course, have been within a much less remote period. Our whalers, we are told, sometimes visit this group, where they receive kids, poultry, &c. in exchange for muskets and other fire-arms which are eagerly sought after by the inhabitants. Little reliance can be placed on native statements regarding population when collected in large towns or spread over wide tracts of country, but within a circumscribed area like one of the Ceram Laut isles their estimates are generally more correct—and it does not therefore surprise us to be told that Kaliwaroo, one of the smaller islands, contains 1,000 inhabitants, there being altogether 100 houses and huts; ten individuals for one family being a scale not at all too high for these countries, where crowds are often found under a single roof.

---

* From the Singapore Free Press, 6th October 1836.

The various articles of commerce—the produce both of sea and land—which are brought from these islands consist of tortoiseshell, mother o'pearl shell, beche de mer, wild cinnamon, wild nutmegs, and birds of paradise. The natives themselves, however, of the Ceram Laut islands have never visited this port, the trade to it from thence being exclusively carried on by the Bugis—those Phœnicians of the Eastern Archipelago—of whom a few are settled on the islands; while others resort there as a trading station. Their method of dealing with the natives, is to make them advances in cloth, both of their own as well European and Indian manufacture, and other merchandise, contracting to receive their value in the various articles we have just specified; and as a security for the due fulfilment of the contract, receiving in pledge from the natives their gold ornaments, fire-arms, consisting chiefly of swivel guns, &c. The natives of the Ceram Laut islands repair chiefly to the northern coast of Papua, or the island of New Guinea, from which they are distant only about a day's sail, to procure the various articles of produce we have mentioned—that part of this vast island being called by the Bugis Papua Notang. Mother o'pearl shells are however procured by the Bugis themselves in greater quantities at the Aroo islands. The Papuans are described as living in a totally savage state, for the most part going about in a state of entire nudity, and scarcely possessing any thing that deserves the name of a habitation—many of them living in caves, or taking shelter in the hollows of trees. They are extremely jealous of the approach of strangers to their coasts, scarcely permitting them to land even for the purposes of traffic, and compelling them to go away immediately on their trading transactions being closed. The Bugis themselves seldom venture to go among them, except in company with the natives of Ceram, or the Ceram Laut islanders with whom the Papuans appear to be on terms of friendly correspondence. The Bugis, we are told, never go to the Papua country without carrying a pass from the chief of Ceram —this consists simply of a small piece of cloth stamped with the seal of the chief—who, if he bears any ill-will to the bearers of it, will sometimes secretly dispatch another missive signifying that he desires their destruction. This is done by transmitting in charge of some of his own people another piece of cloth cut across in one or two places, and the desire which this treacherous missive conveys has, we are informed, been more than once carried into execution at the expence of the unsuspecting Bugis. The Papuans it seems have not yet been made acquainted with the use of fire-arms among themselves; they have the sumpit or blow-pipe, but their principal weapons are the bow and arrow, and a light spear or lance. They are unable to construct vessels of their own; and the art of navigation in its most elementary state is stated to be altogether unknown to them. Of their form of government we have learnt nothing—a number of petty chiefs, apparently independent, are found by the Bugis to occupy the coast of Papua Notang, but whether they are subject to a common sovereign is not known.

Although the inhabitants of the Aroo islands are represented by the Bugis as being of the same race as the Papuans, they enjoy a much more unrestricted intercourse with the inhabitants, who trade freely with them and permit them to settle. Mother o'pearl shells are obtained here in great quantities, and tortoiseshell and trepang or beche de mer, are also procured. Coarse Indian cloths, elephant's teeth, fire-arms, arrack and slaves, compose the principal Bugis imports at these islands. Of arrack the Aroo people are said to be immoderately fond. The slaves brought there by the Bugis for sale are nearly all Papuans—not purchased, but carried away by violence, or seduced by fraudulent promises, from their homes. We have been informed that the Ceram and Ceram Laut people are the principal actors in this barbarous practice, and that it is by them these wretched beings are carried away from the coast, and brought to the Ceram isles to be there sold to the Bugis. This fact may well account for the apprehensions manifested by the Papuans on the approach of strangers; and the particular jealousy displayed in respect of their Bugis visitors would be better explained if the latter confessed that they themselves bore the largest and most active share in these atrocities, which we little doubt to be the case. The Aroo people employ their Papuan slaves in diving for the mother o'pearl shell, and in fishing for beche de mer. The people of the Ceram isles appear to have themselves little or no communication with the Aroo islands.

AN ACCOUNT OF THE MOST LAMENTABLE ILLNESS AND DEATH OF HER YOUNG AND AMIABLE MAJESTY, THE QUEEN SOMANASS WADDHANAWATTY, THE LAWFUL ROYAL CONSORT OF HIS MOST EXCELLENT AND GRACIOUS MAJESTY SOMDETCH PHRA PARAMENDR MAHA MONGKUT, THE REIGNING KING OF SIAM.

THIS Princess was born on the 21st of December, 1834, and was the only daughter of His Royal Highness Prince Laksnanugun, who died in the beginning of June, 1835, six months after the birth of this Princess. Whereupon his late gracious Majesty, Somdetch Phra Nang Klau, C. Y. H., took great compassion on the Orphan Princess, and took her to the grand royal palace, adopting her as his own daughter. She was placed under the care of her aunt H. R. H. the Princess Wilasee, who also died during her niece's infancy. After this event the late King had exceedingly great compassion on his adopted child, and made a royal mandate, endowing her with all the estate and retainers of her natural father as also with those of her royal aunt. He also conferred upon her all the honors and privileges belonging to the highest rank of royal children, and gave her the title of Phra Ong Chau Somanass Waddhanawatty. At the ceremony of the cutting of her hairs, she being then 12 years of age, her adopted father made a royal procession suitable to Princesses of the highest royal birth, who are entitled Chau-fa, or children of royalty by a Princess of royal birth. The ceremonies of the hairs cutting of their present Majesties, the first and the second Kings, were also celebrated in the same manner, they both being of the highest royal birth. This Princess was therefore respected by a great many people, both native and foreign, and by all the adjacent tributary countries during the late reign.

On the demise of His Majesty Somdetch Phra Nang Klau, C. Y. H., the late King of Siam, and accession to the throne of his successor Somdetch Phra Paramendr Maha Mongkut, the reigning King—the whole council of royalty and nobility, seeing that this Princess was without a protector, had great compassion on her, and unanimously proposed that she should be united by marriage and coronation to His Majesty the reigning King, as his royal consort.

Not a single dissenting voice was heard at this proposition, as they knew that His Majesty had just retired from the priesthood (which he had avowed for 27 years) and had no lawful consort by whom he might expect an heir to future royal authority. The ceremony of the royal nuptials and coronation took place on the 2nd of January, 1852, His Majesty being then 48 and the Queen 18 years of age. Since she was married and crowned in full dignity as Queen consort she was respected, both in private and in public, and was treated with the highest honor by the whole of the Siamese nation, and often received respectful compliments and presents from the adjacent tributary countries and even friendship presents from certain noble persons and gentlemen of foreign countries, who were formerly correspondents of His Majesty the present King, so that she was well and happy for six months, in which time she became with child in due course of nature. But alas! it was the pleasure of Super-agency (God, merits and demerits &c, demons &c, according to different faiths) that it should be otherwise; an unfortunate event befel her and she became ill of a fatal disease which at first appeared curable by all the physicians both foreign and native, they professing it to be only a natural consequence of pregnancy, such as loathing of food, vomiting &c. On the 25th of June, 1852, the disease first shewed itself by great pains in the umbillical region accompanied by vomiting; at this time the physicians then observed that the disease was in the abdomen and not in the gravid womb.

After the eclipse of the moon on the 1st of July, she seemed to recover her health, but alas! after 40 days when she had arrived at the 6 or 7 month of her pregnancy, her former painful suffering returned until the 18th of August, when her disease became serious, and a miscarriage became inevitable; this event happened on the 21st August (at 1 P. M.) when Her Majesty was safely delivered of a male royal infant. Her royal son was alive but very feeble, crying and giving the usual signs of infantile life. A great many persons of royalty and nobility were immediately assembled with the officers of the palace, and welcomed the royal heir's arrival by birth, with the highest order of music, and other demonstrations of joy. They made its bed in the golden seat covered with white, and surrounded with valuable royal weapons, a book, pencil &c. in accordance with the ancient royal custom. Alas! the weak royal infant only lived three hours after its birth, it died at 4 P. M. on the same day, its life being but a brief one.

The officers then secretly carry away the body, letting Her Majesty believe that it was well and in another room, as her former sickness was still on her. That same night her Majesty became worse and vomited so frequently that she almost died from this attack, the Siamese official physicians tried to revive her, but they could not succeed to stop the painful vomiting even for half an hour.

His Royal Highness the Prince Krom Kluang Wangsa Dheraj Sniddh administered some homeopathic medicines, from the effects of which Her Majesty's frequent vomiting was relieved and she had the happiness to have a good sleep at 4 or 5 o'clock A. M. Next day, the 23rd August, H. M. the King and H. R. H. Prince Krom Kluang Wongsa Dheraj Sniddh, and a great many princes and princesses, with the servants of Her Majesty, consulted with several Siamese physicians and took the counsel of all who were in her service, as to placing her under the care of Dr Bradley, one of the American physicians now in Siam, who had been called to consult with them. Dr Bradley treated Her Majesty's disease according to the Homoepathic mode, which has but lately been introduced into Siam by himself.

His system of applying medicines is not so much believed in by the Siamese as it ought to be.

It was thought necessary to indulge Her Majesty a little in her desire to follow the Siamese mode of being confined.—She accordingly lay alongside of a fire, (the universal practice of Siamese females after child-birth)—although Dr Bradley and a few of the believers in his system of medicine who were present, were of a contrary opinion.

And Her Majesty was then placed under the homoepathic mode of treatment of Dr Bradley. Under his care, Her Majesty was a little relieved from her frequent attacks of squeamishness, vomiting and fever.

She had frequent attacks of this disease for 7 or 8 days until the 28th of August, being the 7th day after the death of Her Royal son Prince Chau Fa, (an honored appellation applied to children and persons born of the King by the Queen, or of any high prince by a princess of the rank of Chau Fa, or in other words born of parents that are both Chau Fa) when Her Majesty having known of the death of royal son.

Their Majesties (the King and Queen) then prepared valuable presents and offered them to an assembly of Budhist priests and scattered balls containing coins to the people in every direction from Her Majesty's residence. This money was prepared as customary on such events for offerings at the death of their Majesties' son Prince Chau-fa. Since the 29th and 30th of August, however, Her Majesty unfortunately became worse and discharged from her stomach large quantities of bile of a dark and yellowish color; and accompanied by fever.

Dr Bradley then begged of the princes and nobles that Her Majesty should withdraw from the fire and entirely follow his mode of treatment; this was complied with, and being entirely under the care of Dr Bradley, at length Her Majesty seemed slowly to recover, the vomiting was less frequent and the fever disappeared, but she continued gradually taking less food and thereby became very feeble and thin. In this state, Her Majesty continued till the 11th of September, when her feet appeared to be swollen and other bad symptoms appeared, which much alarmed her friends and relations, they consulted together and resolved to try a Siamese physician. In fact Her Majesty had not much belief in Dr Bradley's system of medicines as he was a foreigner—and she would not credit the statements of Dr Bradley and others that believed Homoepathy, that a few drops of spirits in a spoonful of water would cure her disease. Her Majesty therefore tried again a Siamese physician who administered to her medicines after the Siamese mode—but she got no better under his treatment and even got worse, so much so, that no Siamese physician would take her case in hand. Dr Bradley was therefore sent for again, who treated her after his own mode. While under the treatment of the Siamese physician, the vomiting of black and yellow matters continued, accompanied by painful affections in her breathing &c. These attacks occurred 7 or 8 times a day.

Since the return of Dr Bradley to attend Her Majesty, up to the 16th of September, Her Majesty seemed to be a little better, as the vomiting of the black and yellow substances, supposed to be bile, became less frequent and other bad symptoms being less than when she was under the treatment of the Siamese physicians, but alas! Her Majesty's weakness and refusal of sustenance yet prevailed on account of her continued vomiting; there was not a single day passed without severe vomiting which obstinately refused to yield to any remedies. After the lapse of a few days, Dr Bradley had not yet succeeded in making her vomitings less frequent. The intervals between her attacks of vomiting now became less distant, and unfavorable symptoms appeared and her face and body presented a yellow appearance. In consequence of this, she was again put under the care of official Siamese physicians, but they refused to take her case in hand. Upon this a proclamation was issued offering a reward of many piculs of money to any one who could restore Her Majesty to her former health. Since the time Her Majesty became worse under the hands of Dr Bradley, her pulse became very quick and violent, and on the 27th of September, she became delirious. On this same day a royal proclamation was issued to the people of the city, offering a reward of two piculs of money to any one who could make her better. An old Siamese official physician then came to examine Her Majesty, and wished to try his skill, and was therefore permitted to see her. On seeing Her Majesty he misunderstood her complaint, and attributed the disease to mismanagement during child-birth or time of confinement, because she did not lay near the fire; from his statements it appeared that he would cure Her Majesty in a short time and got the consent of Her Majesty's relatives and friends, and even that of His Majesty, to try his skill. But alas! two or three hours after drinking three or four spoonfuls of his aromatic medicines, Her Majesty became so delirious that she could not speak so correctly as before, and occasionally cried out with a loud noise and became much agitated and continually moving to and fro. His Majesty then immediately rejected the old, ignorant and covetous physician, and again called Dr Bradley who attended Her Majesty till her death of which she appeared to be soon a victim. The Doctor restored her by homoepathic medicines, but his success was only partial. On the first day of

October, Her Majesty's eyes became strangely fixed, and she remained silent, refusing medicines and nourishment. On this day it was observed with certainty that there was an abscess which must have occurred probably before she became pregnant, and had been injured by the increase of her gravid womb and also had been broken by the violent agitations of her body during her illness, pus and matter mixed with blood found an outlet at her umbilicus, it continued to discharge freely and by degrees for days. Her Majesty by means of some remedies and applications in various ways was restored to consciousness, although she was manifestly failing in strength until the 6th of October. During this interval His Majesty the King and Her Majesty's kindred brought many gifts of yellow cloths &c to her and induced her to present them as her last offering to the priesthood, and to receive the sacred instructions for her last meditation, from the high priests according to Budhistical tenets in which Her Majesty placed her faith. Her Majesty then offered those clothes &c. to many hundreds of Budhist priests, and received their instructions and benedictions, though labouring under painful attacks of vomiting &c. which caused her daily to lose her strength. Alas! on the 6th of October there was indubitable evidence that the abscess was also discharging its contents into the cavity of the uterine, after this for three days, Her Majesty sunk rapidly, and breathed her last breath on the 10th of October, 1852, at 6 o'clock P. M. greatly lamented and bewailed by all the royal household.

Her Majesty's remains were bathed and adorned with golden ornaments used for the dead according to the royal custom, in the full style and dignity of a Queen and wrapped in many folds of white cloth. Her remains were then placed in the golden urn or vessel called Phra Kote with a queen's crown on her head and then covered with the cover of the golden urn. On the same night Her Majesty's remains were removed from the queen's residence to the Tusita Maha Prasad a great and richly gilded hall of the grand palace, and placed in the same apartment in which the royal remains of His late Majesty layed during 13 months, from April 1851 to May 1852. Her late Majesty's remains now lie there in state, surrounded with all the insignia of rank, until the burning takes place in about 4 or 5 months more and will be attended with considerable ceremonies suitable to Her late Majesty's exalted rank. This event will perhaps take place about March or April proximo. Her most amiable and youthful Majesty the late Queen Somanass Waddhanawatty was the beloved and adopted royal daughter of His Majesty Somdetch Phra Nang Klau C. Y. H. the late King of Siam, since her infancy. At the 13th year of her age she was dignified to the highest rank of royal daughters called Chau-fa and became the queen consort of His present Majesty Somdetch Phra Paramendr Maha Mongkut Phra Chom Klau Chau Yu Hua, on the commencement of this present year and lived happily with her most esteemed and lawful royal husband the King of Siam, for only seven months, from January to July; and from the 10th of August till the 10th of October, being 62 days and nights, Her Majesty was ill, making 9 months, and a few days that she lived as Queen Consort.

Her Majesty's death, happening in her youth and amiableness, and after such great prosperity and happiness which she enjoyed but for a short time, was much lamented and bewailed by His Majesty, by the people of the city and by foreigners of tributary countries.

After Her Majesty's death, all the Siamese, Chinese and American physicians concluded that there was great reason to believe that the foundation of the disease, which destroyed the valuable life of Her Majesty, must have been laid sometime previous to her espousal to His Majesty the present King, from Her Majesty's being uncommonly stout for a person of her age and having suddenly become thin and emaciated and being attacked at the same time with a severe fit of coughing, but the symptoms of Her Majesty's disease did not shew themselves till the 25th of June, as has already been stated.

As Her late Majesty was an orphan and became the adopted daughter of the late king by whom she was made to inherit the whole estates and retinues of her late royal parents and aunt; being the only daughter, she has no half or full brothers and sisters, and has consequently no heirs. The whole of her property and large amount of money, together with her annual income or private fortune, will be placed in the royal treasury till after her funeral ceremonies are concluded.

His Majesty the present king has concluded that a portion of Her late Majesty's great property and money will be expended to refit the sacred places and monasteries belonging to her late royal father and aunt, and another portion will be expended in the construction of a sacred building within the new wall of this city and will be called Somanasswihari the remainder will be employed in the royal treasure for the use of the public. As there are many of Her late Majesty's acquaintances in almost every province of Siam and adjacent countries, among them are even some persons of China, Batavia, Maulmain &c. who were, or are, the intimate friends and agents of His Majesty and became her friends for His Majesty's sake, His Majesty therefore commanded that an account of the illness and death of Her late Majesty be prepared in Siamese, to be issued by proclamation throughout the kingdom of Siam and adjacent countries and also to prepare an account of the same in the English language to be printed and sent to all her English friends, so that they may know accurately about her..

Printed in Lithographic press at the Royal printing office, 21st December, 1852, which is the second year of the reign of His Siamese Majesty Somdetch Phra Paramendr Maha Mongkut.

Table of the average Monthly Temperature indicated by the Thermometer at the Horsburgh Light-House, deduced from daily observations.

1851.

Month	6 A. M.	12 Noon.	Month	6 A. M.	12 Noon.
November .	81.°03	81.°90	December.	79.°96	80.°22

1852.

Months ...	6 A. M.	12 Noon.	Months ...	6 A. M.	12 Noon.
January....	78.°39	78.°71	July	82.°29	82.°54
February ..	79.°62	79.°83	August. ...	81.°74	83.°25
March	80.°00	81.°22	September..	82.°03	82.°66
April	81.°00	83.°00	October ...	81.°35	82.°83
May	82.°58	83.°03	November..	81.°53	81.°96
June	82.°13	83.°53	December ..	79.°61	80.°96

Extremes of Temperature in each Month.

1851.

Month	Lowest.	Highest.	Month	Lowest.	Highest.
November .	81.°00	82.°00	December .	78.°00	82.°00

1852.

Months ...	Lowest.	Highest.	Months ...	Lowest.	Highest.
January ...	78.°00	80.°00	July.	81.°00	84.°00
February ..	79.°00	81.°00	August.. .	80.°00	84.°00
March. ...	78.°00	82.°00	September..	80.°00	84.°00
April	80.°00	84.°00	October. ..	80.°00	84.°00
May......	82.°00	84.°00	November..	80.°00	82.°00
June	80.°00	84.°00	December. .	78.°00	82.°00

Register of the Rain fall at the Horsburgh Light-House, showing the total fall of each month deduced from daily observation.

1851.

November....	4.62 inches.	December.....	17.67 inches.

1852.

January......	3.29 inches	July.	5.51 inches
February.....	0.60 do	August.	3.79 do
March........	0.74 do	September . . .	5.15 do
April.........	5.96 do	October.	8.80 do
May..........	3.05 do	November. . .	11.44 do
June	6.78 do	December. . .	4.20 do
		Total fall of 1852	59.31 inches.

CENTRAL ARCHAEOLOGI
New Delhi

Col—
11.5.74.

"A book that is shut is but a block"

CENTRAL ARCHAEOLOGICAL LIBRARY

GOVT. OF INDIA
Department of Archaeology
NEW DELHI.

Please help us to keep the book clean and moving.